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GAS JOURNAL

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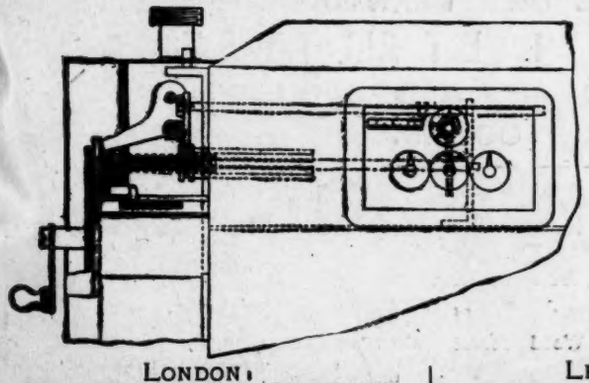

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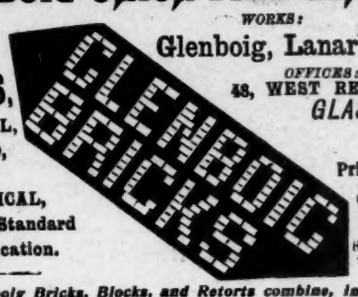

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VOL. CXXXVIII., No. 2812.] TUESDAY, APRIL 3, 1917. [69TH YEAR.

EDITORIAL NOTES.

Coke Use and Distribution in London.

THE experiences of the past winter in relation to fuel supply bring us into immediate touch with the probabilities of next winter; for whatever is going to be done in the way of endeavour to prevent, as far as possible, a repetition of the conditions as to fuel supply that have prevailed the last few months, must be done quickly. In respect of next winter, there is only a single factor about which there is any doubt that contributed to the recent inconveniences and misery occasioned by the insufficiency of the means of fuel distribution, and that is the climatic one. Of the other factors—conditions of sea, rail, and road transport, and of labour—it may with surety be said that, unless the war collapses before then (which does not appear probable), they will be intensified next winter in comparison with the one from which we are now emerging, and the severities of which we shall be glad enough to leave behind.

In the papers last week it was announced that the Board of Trade were ascertaining from the London local authorities the possibilities of co-operation with the gas companies in the matter of the distribution of coke. Local authorities have no statutory power to undertake such work as the distribution of fuel; but, in these times, there is no standing upon formalities in serving the country and the community. Asked in the House the other night as to this matter, the Parliamentary Secretary of the Local Government Board stated that, if the Government decided that such powers should be conferred, Lord Rhondda would give all the help he could. This is all so far satisfactory. But it may be respectfully suggested that the assistance in coke distribution by local authorities is only one phase of a very large question, and that it would be well if the Coal Controller appointed a Fuel Expert to assist him, in order that there may be, as far as possible, a proper dispensation of suitable fuel—particularly to places requiring it for steam raising. As coal is necessary for making gas, which is a fuel of good thermal value needing no labour or vehicular traffic in its distribution, as the making of that gas leaves about 10 cwt. of coke from every ton of coal carbonized also for use as fuel, and as coke has come into great request in these times, the Fuel Expert should be one who has special knowledge of this particular class of fuel, which knowledge all coal experts do not possess, and therefore are not in the best position to advise as to its use. Such an expert should be given power to obtain returns as to available stocks, and their position, and to organize their economical distribution. We venture to suggest that the London Coke Sales Committee could inform Mr. Guy Calthrop—if he has not already knowledge of the gentleman we have in mind—where to put his hand on such an expert who has for some years been making a study of the fuel conditions of London and the utilization of coke.

The coal position in London could—now that the consumption curve is on the decline, prior to its re-ascent later in the year—be greatly relieved by immediately taking in hand the work of organizing the more extensive use of coke, such as for steam-raising where the boiler power has sufficient margin, and by making coke and not coal the fuel to be stored during the summer in domestic cellars, or, at any rate, specified proportions of each, and by properly organizing the means of coke distribution from numerous controlled centres. We are glad to see, in connection with the general question of coal distribution, that the Coal Controller is, with the hearty co-operation of the Canal Commission, now endeavouring to relieve the pressure on the railways by arranging for the transport of more coal by canal. But in this connection, reminder should be made that—while the economy in haulage, &c., which will accrue from the necessary establishment of more canal and river side coal depôts is, of course, obvious—the number of existing coke distribution centres is very small compared with the number of coal wharves and sidings, which is an organization matter that would have to be dealt with.

Although so far we have been referring to the question of fuel distribution in respect of the Metropolis, there is no doubt that what is done in London will be utilized in the Provinces; and to assist local organization is therefore another reason for pushing forward with the plans so far as London is concerned. In every city, town, and village, gas undertakings are the greatest individual fuel retailers—solid and gaseous; and in all communities the shortage of house coal last winter was made up automatically with gas, and by a greater demand for coke. The lot of the poorest section of the communities would have been considerably worse than it then was had it not been for their slot gas-meters and the power to purchase coke in small quantities. The facts of their position certainly entitle gas authorities everywhere to special consideration and to a place in co-operation in the work of organizing fuel supplies in these times. It also entitles them to primary supplies of coal, or at any rate to every facility for putting into stock in summer an ample supply of coal, so as to ensure them the power to meet the new standard of conditions set by the past winter.

Manufacturing Economy and Coke Gasification.

IN these days most things move quickly; but it is an old habit of the gas industry to move with leisurely gait. Sometimes there is advantage in this; but the inveterate character of the habit must be considerably modified, especially now that the alert industries are making their plans for getting as large a share as possible of the proceeds of the national and industrial revivification to which all now look forward. What in the way of preparation is the gas industry doing in this connection? What is being done by way of preparation in the electrical industry? These are two questions that should have simultaneous consideration, and the replies be put down side by side. Some time ago the Board of Trade appointed a Committee to consider the question of the development of the electrical trade after the war. It was a Committee of experts; and their report is in the hands of the Board. One part of it, so it is hinted, treats of the necessity for facilitating the production of cheap electricity. Again, all over the country there are Committees at work on electricity station interlinking schemes, with the view of reducing fuel and other costs by making the best use of the most economical plant, by shutting-down the less economical plants at week-ends, and by helping the smaller plants over peak loads, incidentally contributing, too, to greater security of the continuity of supply. The main object of these schemes is economy [see "JOURNAL," Oct. 24 last, p. 168]; the effect of economy is lower prices than would otherwise obtain. Now the Board of Trade have appointed a further Committee [see "Electricity Supply Memoranda"] to consider and report as to what steps should be taken, whether by legislation or otherwise, to ensure that there shall be an adequate and economical supply of electric power for all classes of consumers—particularly for industries depending upon a cheap supply of power. This is a movement which may mean a great deal to the electricity industry. It may also mean a great deal to the gas industry. If the electricity industry can supply cheaper power than it is doing now, the development of the business may promote lower priced electrical energy for all purposes. If the gas industry can

also simultaneously supply cheaper power than it is doing at present, so much the better for the nation at large, and so much the better for its competitive position.

Is there anything that the gas industry can do in working for economy that it is not specifically or generally doing at present? The British Commercial Gas Association are "saving up" for taking part, in its own particular ways, in the industrial and trading revival after the war. This is very right and proper; but what steps are being taken at the manufacturing end to support by the provision of cheaper B.Th.U. whatever the Association may do? It goes without saying that the cheaper the industry can supply heat units, the greater will be its part in the post-war industrial revival, the greater will be its power in eliminating coal waste, the better will it be equipped for meeting any keener competition that may arise through the fostering schemes that are settling about the electrical industry. The Board of Trade are not proposing a Committee to consider how or in what way a cheaper supply of gaseous energy can be provided by the gas industry. Perhaps the Board think the gas industry is quite capable of looking after itself. Whether or not this is the case, it behoves the gas industry to do so. But what are its opportunities? It is clear that coal, oil, labour, structural and other materials, together with taxation, will not get back to their old cost levels for several years—some of them (so far as present evidence admits a forecast) will never do so. Development of the bye-products of gas manufacture may and will contribute to the alleviation of these drawbacks. But because of these drawbacks, is the gas industry to leave matters to chance, by waiting for something to adventitiously turn up? Or will it investigate its own resources, and see what can be made of them to counteract the restraints of high prices, and to be prepared for the industrial renaissance and the competition for supremacy in supplying the heating and power requirements of industry, and in furnishing the commodity that shall do most and go furthest in suppressing the household waste of coal? Coke is one of the gas industry's own gas-manufacturing resources.

A fortnight ago we published an article on the "Relation "of the Calorific Power of Gas to Fuel Economy;" and in it reference was made to the possibility of further bringing coke to the aid of manufacturing operations by producing blue water gas for mixing with ordinary coal gas—thus putting B.Th.U. into the gasholders at a cheaper rate than is possible to-day. The suggestion is not a new one; it is many years old. But contemporary developments within and outside the gas industry have made the subject one of greater fascination, and have increased the prospects for the gas industry of an economic expansion of practice in this direction. Long since, plant was designed for this purpose. Many men from time to time have alluded to the subject and its possibilities—one of them Mr. Thomas Glover in his Presidential Address to the Southern District Association in March, 1914. Mr. Glover then had no thought that three or four months later heavy war clouds would have gathered—and burst, with tumultuous effects for the whole world. In the address, he showed how general manufacturing economy might be served, and the accumulation of surplus coke stocks be lessened (which was an imposing aspect of the gas industry's condition then, as it may be after the war), by the manufacture of blue water gas or lightly carburetted water gas for mixing with ordinary coal gas, and so reducing the cost of putting a good calorific value gas into the holder. At the same time, he described the most suitable conditions for manufacturing the gas. The succeeding and present prices of coal and oil, as well as the conditions of labour, accentuate what was then said; the outlook as to the requirements and the competition with the gas industry that there will be from various quarters after the war, give further emphasis; the change from the illuminating power standard to the calorific value one holds out an invitation for a further investigation of this inherent resource of the industry to promote economy, and to enable a reduction to be made in the retail price of thermal energy in the gaseous form.

In a letter in our "Correspondence" columns last week, Mr. Glover spoke of a production of 60,000 c.ft. of gas per ton of coke, and of the possibility of making a 25 per cent. addition of this gas to the coal gas produced—thus supplying a gas of satisfactory calorific value; a gas that will give a good flame temperature; and a gas that is clean, with only a modest percentage of incombustibles in its composition. We are reminded by this, too, of the Presidential Address of Mr. J. E. Enright to the Irish Association last year, in which he (in the throes of a condition of things where it was not known when the next ton of coal would arrive, and that coal, too, including freights, costing but few shillings short of £3 per ton) showed the large economy and safety of a carburetted hydrogen plant in which he was using coke and tar. By the aid of his two producing plants, he was supplying Tralee with approximately half coal gas and half carburetted hydrogen gas (sometimes a greater proportion of the latter) at a much lower price than would have been possible with coal gas alone—the mixture having a calorific value of about 500 B.Th.U. The address and the data accompanying it are worth looking up to-day when coal and oil delivered are dear, when fuel economy is in the air, and when the gas industry should be preparing its plans for taking, through cheaper heat units, a larger part in the great forward movement that every patriot hopes will be made by the country as soon as it and its Allies are released from this consuming war.

The Government Payment for Benzol, &c.

The suggestion that Mr. Frank Livesey submitted to the National Gas Council, in the letter that we published last Tuesday, as to an investigation being instituted into the prices paid by the Government for benzol, toluol, phenol, &c., and an application being made to the Ministry of Munitions for an increase in these prices, does not meet with the approval of Mr. L. Trewby, the Engineer and Manager of the North Middlesex Gas Company, and (we gather from his letter in our "Correspondence" columns to-day) of a few other engineers. But we believe such engineers have an overwhelming majority against them. However, it will be remarked from his letter that Mr. Trewby is sorry to see the "Journal" subscribing to what he characterizes as Mr. Livesey's "unpatriotic" views. We fail to see (making an impartial examination of the whole of the circumstances) the slightest indication of any want of patriotism in the proposal. Mr. Trewby's judgment we are inclined to think is based on a misinterpretation. He says: "If I under-"stand it aright, Mr. Livesey is of opinion that because "large numbers of traders have been able, owing to the "abnormal times, to force-up the price of their commodities "or of the service they render, and thereby make extraor-"dinary profits, the gas companies should depart from the "high standard of conduct hitherto observed, and come in "and scramble for some of the 'pickings.'" There is not the slightest justification to be found in Mr. Livesey's letter for any such understanding. There is no intention of scrambling for war-profit "pickings;" and there is no claim for extraordinary profits. Such scrambling and such claim cannot in the circumstances exist; for, under Mr. Livesey's proposal, the Ministry of Munitions would see to both. It is true the Ministry (who are more careful now) have in the past paid unduly large profits on guns, shells, and many other things, but not for benzol, toluol, phenol, &c.

The ground that Mr. Livesey takes is obviously one of justice; and he merely asks that an appeal shall be made to the Ministry of Munitions to raise their fixed prices for the war necessaries that the gas industry supplies. The prices would still be fixed; so there could be no scrambling for "pickings." It is quite true that in his letter to the National Gas Council Mr. Livesey two or three times used the expression "substantial increase;" but he gives an indication of what he intends by this when he says the increase should be such "as will enable oil-washing at "medium-sized works to be carried on at a profit, and "will enable small gas companies to sell their tar to dis-"tillers and make for it at least 2d. per gallon net." Really we cannot see anything "unpatriotic" "improper," or "unreasonable" in this. If all the factories turning out munitions had been paid on the same lines for their productions as the gas industry has been paid for its war products, they could not possibly have kept going. On the contrary, they have in many cases been paid on a scale—the shame of it!—that has allowed the return to the Government of 50 and 60 p.ct. excess profit, the balance permitting payment on capital of quite unusual dividends. That is an unreasonable condition of things. What Mr. Livesey suggests is reasonable, and nothing more. It will be remembered that he quoted a couple of instances where the treated tar is not paying to the producing works even the cost of carriage; and we know there are several cases that rank in proximity to these illustrations. This ought not to be. Those considering this matter must do so from

all standpoints, and not from a single one only. They must also avoid confusing reasonableness and unpatriotic action, and concede the possibility of justice and patriotism going hand in hand. Nor should the Government try to use patriotism as an excuse for a policy of no give and all take. The gas industry came to the aid of the Government in a most critical time in regard to high explosives; and now that critical time has passed in relation to supply (though there is a desire for still larger production), surely there is nothing discreditable in asking the Government to make such a revision of the terms as will have the modest effect that Mr. Livesey suggests.

The Professor's Justification by Platitudes.

One of the most unsatisfactory men with whom we have ever had to deal is Prof. Henry E. Armstrong. His present strongest point is his adhesion to the belief that he has a mission to perform in warning the gas industry of its danger, and in accusing its professional men of impotence and want of foresight; his weakest point is an inability to give us a practical scheme, in technical and financial detail (asked for in an editorial article, headed "The Accuser and "his Plans," published in the "Journal" for March 6), to show the extent of the success—if any—that would follow the displacement of present gas plant and methods by low-temperature carbonization, and all that it involves. It does not appear to strike the Professor that in this matter he himself may not be infallible, and so may be mistaken. On the contrary, every time he sits in judgment on the men of the industry and their operations—whether by writing or by word of mouth—there is an atmosphere about it all which suggests that he is completely wrapped-up in his own infinite wisdom respecting the right system of technical procedure for the gas industry. Prof. Armstrong has not come down from his platitudinal heights and accepted our invitation to demonstrate what (if any) foundation of practicality he possesses for his beliefs; but he has yet again found a place in "The 'Times' Trade Supplement" for another wordy outpouring, which does not bring us any nearer to solid substantiation—or otherwise.

Possibly he does not realize it; but this fresh article of his removes him further than ever from the practical stage. He refers to the recent meetings of gas companies that he has attended; and to the suggestion Mr. Charles Carpenter, D.Sc., made at the South Metropolitan meeting, that during the war the use, as far as possible, of raw coal should be prohibited in London, that it should be carbonized at gas-works, the valuable products be recovered, and the coke be distributed for domestic consumption. This suggestion the Professor describes as visionary. He has evidently been reading the comments we made on the matter on Feb. 20, which indicated the view that the capacity of gas-works for doing as Mr. Carpenter suggests is not governed by the amount of spare plant they possess, but by the demand for gas. The Professor grasps this argument, and submits another not without its peculiar side. "Supposing," he says, "the "gas undertakings were to set to work to produce a satis-"factory fuel—a more easily burnt coke—and carbonized "coal at much lower heats than those now adopted, though "they would produce half the volume of gas now made, "it would be far too rich for use. If this gas were diluted "with either water gas or producer gas to the desirable "calorific standard, they would again be producing more "gas than was required." So the gas undertakings are "on the horns of a dilemma." In the first place, no self-respecting technical gas man would think of using as a diluent producer gas with its large percentage of inert constituents. In the second place, we see no obstacle, if the balance-sheet is advantageously served, to doing precisely what Prof. Armstrong says cannot be done "owing to the "production of more gas than is required," inasmuch as the plan does not put the power of regulation of the proportion of diluent to coal gas beyond the reach of the gas engineer. If it did, down would fall Prof. Armstrong's low-temperature proposal as a practicable method for adoption by gas undertakings. Perhaps he cannot see this. What others can see is that every time he writes or speaks on the subject, he supplies fresh evidence that he is only wandering on its borders, and is not on intimate terms with the internal considerations.

Nevertheless, this does not affect his belief in his own right and ability to sit in judgment on the gas industry. It has only itself to thank for its "unpleasant position;" the position would be more "unpleasant" still if the counsel of Prof. Armstrong were to be accepted. He refers to the backwardness of the situation; and he considers that both Mr. Charles Carpenter and Mr. Charles Hunt—"the two "most distinguished gas engineers in the country"—could not possibly have made "a more complete confession of "the present impotence of the industry" than when they replied to some of his inquiries and criticism that, "if suit-"able processes were submitted to them, they would be "pleased to consider them." Of course, the Professor thinks that the gas industry ought to have spent money and investigated these processes long ago. Does he really think that the competent technical men of the industry have not been expending trained intelligence on investigating the very best that those interested can say of these processes, or can put forward in the way of results? That is where there is a difference between men. If the technical man cannot find sufficient justification for expending money and time on a trial, he is wise not to do it; his trained intelligence would not be worth much to him or those he serves if it did not embrace the power of circumspect discrimination. There are other men who would waste money and time to prove what the trained intelligence is already aware would be inadvisable. Gas engineers would have something to do if they set themselves to put under working trial every process or fad that was introduced to them, or gave much heed to the confused imaginings of a certain type of self-constituted prophet or counsellor. And this particular prophet in regard to this especial matter is an extraordinarily assertive one, which characteristic shows a high personal opinion of the fitness of qualification for the *rôle*. Listen to this: "It is well known that nothing has "been done by the industry to prepare for the rainy day, "the advent of which has so long been foreseen by out-"siders, which will shortly come as a deluge—not a mere "passing shower. And yet public interests are at stake to "the tune of some 150 millions sterling."

However, in this fresh article, Prof. Armstrong has at tempted to justify his interference with or intervention in (whichever term he may prefer) the affairs of the gas industry—an interference or intervention conducted, as has been seen and heard, in the most dogmatic spirit. Though having no connection with the industry (other than that of a small shareholder), he tells us that for thirty years he has taken serious interest in its major problems, and kept himself informed *as far as possible*, while those within the industry only profess ignorance and resent the attempts of outsiders to awaken them to a real sense of their position. Prof. Armstrong has clearly not learnt much that is of material value to the gas industry during these thirty long years if he has only reached the stage of low-temperature carbonization, which the gas industay left behind years ago. And his reference to "outsiders" is an estimate of an ability which may not be entertained by others. But in pursuit of his attempted justification, the Professor gets somewhat illogical.

> We know what has happened at the front—how gradually the young men who have taken to fighting without any of the old prejudices have displaced the professionals. We know what has happened to the Government, and how the outside man of business—not the politician—and the expert are at least being made use of effectively. This same process must come into operation in many of our public companies—especially the gas undertakings. No amelioration of the situation can be effected without this change.

We do not see the connection between fighting men and business. In the war, it is the professional who directs, and not the outsider. We quite agree that the business of the nation should be directed by expert business men and not by politicians, who are the "outsiders"—the Armstrongs (so to speak) in public life—who have tried to run the nation's business, and, as the war has proved, have made a fearful mess of it. We prefer that the gas industry shall be run by experts in its affairs, and not by men who have given no practical proof—nothing but a deluge of words—of their competence to advise as to a change of course in the industry's practices.

The Revision of the Sliding-Scale.

To a letter on this subject by Mr. J. Kelly, of Bridlington, appearing in our "Correspondence" columns to-day, we commend our readers' attention. It constitutes an argument philosophic, practical, and suggestive. It takes the line that, if subsequent

legislation has interfered with the economic conditions that existed at the time of the institution of the sliding-scale, its working is thereby rendered unfair. The communication shows that there has been such interference, quite apart from the war. The principle that parliamentary interference with economic conditions gives investors a right to redress, Mr. Kelly reminds us, was tacitly admitted by the action of Parliament in respect of the Railway Companies at the time of their labour difficulties. The gas industry, in his opinion (with which we agree), has a far better claim than had the railway companies. He also fears—and this is an important point to bear in mind—that after the war legislative interference with economic conditions may be more frequent and extensive than ever before. The case submitted for the revision of the sliding-scale or for "right of redress" grows stronger.

Tar Spraying a Labour-Saving Expedient.

The problem of labour-saving is with us to-day in its acutest form in every line and branch of work. It applies equally to the maintenance of the conditions of our roads as to other operations. A paragraph was in the papers last week to the effect that it had been decided to tar-spray the roads of Camberwell during the summer. The tar-spraying of roads will take place in a good many places besides Camberwell; but the interest lies in the reason given for performing this work. "It will practically do away with all but the minimum of watering." This means not only economy in labour required for watering, but in water itself, and in the wear and tear on the water-carts, as well as a saving in the number of horses required. The economies are manifold; and they extend still further—through the beneficial effects, from the public point of view, in allaying the dust, and through the preservation of the road surfaces, which in turn minimizes labour, and saves road maintenance costs. With the extension of the process of tar dehydration at gas-works, there is a large quantity of refined tar available in the country—suitable for road purposes, though perhaps requiring a percentage of creosote mixed with it in view of its thickening owing to the temperature to which it is necessary to carry the dehydration process to get from the tar all that is needed by the Ministry of Munitions.

The Barnsley Proof of the Coalite Process.

In a letter which appeared in our columns on Nov. 14 last from the Coalite Company (by whom the editorial note thereon was not answered), it was stated that the Barnsley plant, about which so much has been heard in bolstering-up the hopes of Coalite shareholders, was then a few weeks, and at the outside a few months, from completion. We make no particular point of the completion delay in these times of difficulties with materials, plant, and labour. But the plant is not yet finished. This was stated at the meeting of the Coalite Company last week, when the Chairman's speech was again compounded of hope, a rich optimism, and a certain amount of boastfulness. The Directors are hopeful of being very busy dealing with the foreign patents as soon as the Barnsley plant is in operation; and the world is the Company's field. We do not gather that the Chairman specified the patents to which he referred; but evidently, claiming the world as the Company's field, he attaches an importance to the patents with which other low-temperature processes cannot hope to vie. But the existence of other low-temperature processes ought surely to convince the shareholders that they have no monopoly in the principle of low-temperature carbonization, which was practised by the gas industry long before "Coalite" was the name attached to some large speculative enterprises, which worked out badly for those who were induced a few years ago to put money into them by an amount of "big drum" beating which has rarely been equalled. However, the Directors now think the low-temperature distillation of coal must progress by leaps and bounds. The early Directors thought the same. The commercial results still await proof.

The "Last Word" in Carbonization.

However, great things are now promised in this Barnsley plant from the engineering point of view. It is hoped that, when gas engineers have an opportunity of inspecting it, the boasts of to-day will be confirmed. The Chairman states that so many improvements have taken place, principally of an engineering character, in connection with the standardizing of the Barnsley plant that the Directors are quite satisfied it would be a long time before any possible competitor could gain anything like the knowledge possessed by the management; and, further, some of the most important judges in the country who had visited Barnsley were of one accord that the plant was quite unique and the last word in carbonization. We are not told who are the important judges; but if the Directors think well of the suggestion, we invite them to contribute an article to our columns describing this "unique" plant which is the "last word" in carbonization. A plant meriting such description is, no doubt, well protected; and therefore no possible harm could be done to the Company by adopting our suggestion. On the contrary, it would give them an excellent advertisement among the technical carbonizers of the United Kingdom and of allied and neutral countries. It is mentioned by the Chairman that the Government are also watching the development. The interest of the Government is well known to our readers; but should there be any who have missed the information, they will obtain particulars from the editorial note appended to the letter in our issue of Nov. 14 last. It is noted that arrangements are being made to grant a licence to a Development Company which is about to be formed with very powerful interests. Caution suggests that investors will do well to see the results of the Barnsley plant before putting money into any fresh venture.

Sulphuric Acid Making by Gas-Works.

In the paper which Mr. George B. Jones, of Coventry, read recently before the Midland Junior Association (and which was noticed in an article last week dealing with industrial gas-heating), he alludes to the question of the manufacture of sulphuric acid by gas-works. This is a subject that was raised in our columns at the time the chemical manufacturers were seeking through Parliament to restrict the liberties of gas undertakings in making the best possible out of their secondary products. The experiences during the war have accentuated the importance of making the industry, as far as possible, self-supplying in respect of sulphuric acid from the sulphur which it produces in its purification process. The Coventry Corporation Gas-Works is one of the few that manufacture sulphuric acid; and Mr. Jones states that the plant there has been "a blessing during the shortage of acid, and an excellent source of revenue." There is every reason to believe this; and in recent times many suffering gas engineers have, no doubt, been envious of the position of Coventry and other gas-works that produce sulphuric acid. In association with this, Mr. Jones draws attention to a matter which calls for redress in certain gas-works. Samples of spent oxide from other works have been examined at Coventry, with the view to purchase for sulphuric acid making. There has been amazement at the ammonia content in some of the samples from the smaller works—so great, indeed, has it been in certain of them that it would have paid to have bought the oxide for the ammonia it contained. Not only is this ammonia a loss to the seller, but it occasions a loss to the buyer by using up the nitre required in the acid manufacture.

Encouragement of Thrift.

Amid the War Savings Associations and similar organizations which have been a direct outcome of the condition of affairs brought about by the war, it was perhaps only to be expected that attention should to some extent be drawn away from the novel scheme put into operation at Birmingham some time ago [when reference was made to it in the columns of the "Journal"] for the establishment of a Corporation Savings Bank. Long before other cities or towns began to think in "savings," Birmingham, said Mr. J. P. Hilton (Manager of the Bank), in a recent address, had decided to act; and it was not the fault of the Corporation that they were prevented from putting the scheme into operation earlier. This, of course, refers to the opposition which the proposals encountered from certain interests when first the Bill to secure the necessary powers was before the House of Commons. What the bank does for the working man is to provide for deposits by coupons, which he can obtain to whatever extent he likes when he receives his wages. It gives him the fullest security, in the shape of the Corporation standing as guarantor of the principal and interest; it gives him 3½ p.ct. on every completed pound; and it enables him to withdraw any portion or the whole when he wants it. Mr. Hilton explained that the ordinary procedure is for a man to fill up a form

authorizing his employer to pay him a certain amount of his wages in coupons; and on pay-day he gets his coupons, which have gummed backs, and puts them on a card, until the card contains the value of a sovereign. He then sends the card to the bank; and it is exchanged for a bank-book, in which is credited the value of his coupons. The experiment was well worth trying, in one of the best of causes; and it is therefore gratifying to note Mr. Hilton's declaration that the bank has entirely surpassed the expectations and hopes of the promoters, and "is marching rapidly on the road to a most pronounced success." The workers are to be congratulated on the desire they have manifested to save money; but at the same time the co-operation of the employers must be mentioned. This co-operation, it seems, has shown itself to a remarkable extent. In addition to other help, many employers have offered handsome prizes and other inducements to encourage their workers to develop the saving habit. So that all parties concerned have assisted to bring about a notable achievement.

PERSONAL.

The appointment of Engineer and Manager of the Castleford Gas Company has been secured by Mr. George F. Twigg, of St. Heliers, Jersey.

Mr. J. V. Mearns, the Manager of the Ballynahinch (co. Down) Gas-Works, has been appointed to a similar position at the Banbridge Gas-Works. Mr. James Hutchinson, of Holywood, formerly Manager of Portaferry Gas-Works, succeeds Mr. Mearns in the Ballynahinch Managership.

On his retirement from the active management of the Middlesbrough Corporation Gas-Works, Mr. David Terrace has been presented by the staff and workmen with a suitably inscribed writing table. Among the speakers on the occasion of the gift being handed over, Mr. Pattison, representing the older workmen, referred to the great interest that Mr. Terrace took in the employees. He was President of the sick club, as well as of the cycling club, and took an active part in everything connected with the workmen; and he was always ready to help anyone in trouble. At the time when the staff had only one day's holiday, he not only helped the workmen, but also their wives and sweethearts to enjoy it. He had always found Mr. Terrace a good master and a firm friend. On behalf of his fellow workmen he wished Mr. Terrace health and happiness to enjoy his leisure; and he congratulated Mr. Charles F. Blincoe on his appointment as Manager. Mr. Terrace acts as Consulting Engineer to the Corporation.

Much gratification is felt in Littleborough at the success of Mr. S. E. Halliwell, the popular Manager and Secretary of the Gas Company there, in obtaining so important a position as that of Secretary to the Bristol Gas Company, where he follows Mr. John Phillips, who has retired. Mr. Halliwell has been with the Littleborough Company since 1894, and succeeded the late Mr. John Cockcroft as Manager and Secretary in 1901. Since then the Company's business has greatly developed, and there has been an increase of 60 p.ct. in sales through popularizing the use of gas for heating, cooking, and power. As a matter of fact, the day consumption has been more than doubled. He was one of the founders of the Manchester and District Junior Gas Association, and was President in 1902. Many other positions in the industry have been held by him—including membership of the original National Publicity Committee (Institution of Gas Engineers) and the Council of the Manchester District Institution of Gas Engineers. He has acted for the past ten years as Hon. Secretary to the Lancashire Commercial Section (which represents 63 gas undertakings in Lancashire, Cheshire, and North Wales). Mr. Halliwell is a Fellow of the Chartered Institute of Secretaries, and a City and Guilds of London Bronze Medallist in "Gas Manufacture." During his long stay in Littleborough, he has taken an active part in social work there, and has been Secretary to the Joint Lectures Committee, and the Gilchrist and University Extension Courses.

Conference on Refractories Research.—At a conference upon Refractories Research on the 22nd ult., in the rooms of the Iron and Steel Institute, a resolution was passed—"That a Committee, consisting of Mr. A. Cliff, Dr. J. W. Cobb, Dr. R. T. Glazebrook, C.B., Sir Robert Hadfield, Mr. Cosmo Johns, Dr. J. W. Mellor, and Dr. A. Strahan, with Mr. F. S. Spiers as Secretary, be appointed to report to a later meeting on: (*a*) The extent of the research work on refractories already in progress; (*b*) the facilities for research existing in this country; (*c*) the facilities existing for collecting published information on refractory materials, and making it generally available. That they invite the representatives of the principal industries and societies represented at the conference to furnish them for the purpose of their report with (1) a schedule of the problems calling for immediate action, and (2) a statement of the special requirements of the industry they represent.

ELECTRICITY SUPPLY MEMORANDA.

When the intelligence first came, *vid* the agenda of the London County Council, that the Board of Trade were proposing to appoint another Committee to subject the electricity supply industry to a further investigation, the electrical papers were not unanimous in being pleased. There was resentment in certain quarters; but perhaps prejudgment has been modified now that the composition of the Departmental Committee is known. The object of the inquiry is to ascertain what steps should be taken, by way of legislation or otherwise, to ensure that there shall be an adequate and economical supply of electric power for all classes of consumers in the United Kingdom, particularly industries which depend upon a supply of power for their proper development. The Committee is a mixed one; and this may be regarded as a weakness by those folk who think that questions electrical should be dealt with solely by electrical experts. The Committee has as Chairman the Right Hon. F. Huth-Jackson, who, as a Director of the Eastern Telegraph Company, is interested in electricity. There are Mr. H. Booth and Mr. James Devonshire—the latter of whom has a large interest in the electrical industry. Another member is Mr. G. H. Hume, who, as a member of the London County Council, has taken a prominent part in the electrical exploits of that body. There are Mr. J. Kemp, Mr. H. H. Law, M.Inst.C.E., and Sir Charles Parsons, K.C.B., who, besides being a famous inventor, is a Director of certain electricity supply companies. Mr. C. H. Merz has become celebrated through his electrical achievements in the north-eastern industrial area of the country, as well as by his schemes for electrically redeeming London. Sir John Snell, consulting electrical engineer, needs no introduction to our readers. Alderman C. F. Spencer, Mr. A. J. Walter, K.C., and Mr. James Falconer, M.P., complete the Committee upon whom a very important task has been placed. The composition of the Committee does not give an opportunity of making any particularly shrewd guess as to the likely outcome of the investigation; but some of the heavyweights have their prepossessions, and, during their inquiry, and in their report, a good deal will certainly be heard of concentration and linking-up.

Board of Trade and Cheaper Power Supply.

A Chilly Reception.

On the first intimation of the appointment of the Committee, two of the electrical papers found some trenchant sarcasm to hurl at the Board of Trade over their new-born interest in the electricity supply industry; others welcomed the movement as an earnest that the Board were really intent on doing something both benevolent and beneficial. The initial broad smiles over the matter, and the rough digs at the Board, by the "Electrical Times" and "Electrical Industries" were hardly counterbalanced by the smooth words of the "Electrician." The scepticism of the first two papers as to any good coming out of the new Departmental Committee is due to the masterly inactivity of the Board in respect of the industry not only in the deep-down past—from, in fact, the time of Lord Cross's Committee in 1898—but in the present. They should, however, be careful not to discourage the Board just when—possibly—that much overworked and abused body entertain a feeling that they ought to do something to atone for the past. However, the two papers cannot help speaking their minds. Says the "Electrical Times," the history of the Board of Trade in relation to the electrical industry "is such as to render it incompetent ever to promote the industry's welfare." Remarks "Electrical Industries," this new Committee "is intended to go over ground again which has already been well ploughed up." Therefore it regards the Committee as "utterly superfluous." So the proposed investigation on first emerging into daylight was met with a cold blast. The attitude of the Board in regard to linking-up is ridiculed by the two sarcastic contemporaries. First the Board suggested this method of producing economy; and, when schemes were submitted, the Treasury was pushed forward as an insurmountable barrier (until after the war) in the way of the consummation of the economic proceeding. An Electrical Trades Committee, constituted of electrical experts, was appointed some time ago; and their report (which is in the hands of the Board) deals, it is stated, with this very question of legislation for cheap electricity supply. The report has so far been kept concealed by the Board; but evidently its contents are generally well known to our journalistic friends, for they show a feverish anxiety to get it published. They ask the pertinent question why the Board are proposing another Committee when they already have before them a report by a Committee of experts, as well as the schemes for linking-up. It is probable that, owing to the multitude of counsellors, the Board are a bit muddled as to what is best to be done; and so they have decided to start *de novo*, and have a thorough survey made of the position, and a consolidation of recommendations. The "Electrician" adopted a milder attitude than the "Electrical Times" and "Electrical Industries." It is not disposed to discourage the Board. In its opinion the decision of the Board has not been arrived at too soon; for many electric supply undertakings find themselves faced with great difficulties in maintaining their supplies of electrical energy for power, traction, and lighting. Our contemporary hopes the result of the Committee's work will be the evolution of a national scheme for

the development of electricity supply after the war. How the occupants of the respective editorial chairs of our contemporaries must smile as they read each other's views on the subject—the one at the "ferocity" of his contemporaries; the others at the kindly and hopeful reception accorded to the new Committee by their compeer.

On Ferocity, Foolishness, and Evasion.

Sufficient of the subject of the new Departmental Committee until we see how it develops. The contemporary which has given kindly and hopeful reception to the new-born Committee has, we are afraid, another side to its character, for in the very same number it contains a singular editorial appealing, on the one hand, for a little more "ferocity" in the discussions which follow the reading of papers before scientific societies and engineering institutions, and, on the other hand, it has a little dig at Electricity Supply Memorandist. It is to be hoped the respected and proper "Electrical Review" has not seen and read the editorial in question. For of a certainty the first part would shock its decorous notions; with the second part, it might have some amount of sympathy. The idea of "ferocity" in debate is derived from no less an authority and practitioner than Mr. Winston Churchill; and in developing the argument for a little "ferocity" in technical discussions, the "Electrician" makes reference to Shadrach, Meshach, and Abednego, to "terminological inexactitudes," and to Disraeli and his classical interpretation of untruths as "lies, damned lies, and statistics." Later on, there is an allusion to the man who at a discussion keeps a half eye on the President and the other eye-and-a-half on his watch, "anxious to know if he can get to the Waldorf or to the Coal Hole before closing time." However, all this peculiar mixture is presented with the good intention of trying to get a little more spirit and healthfulness infused into discussions. But then we come to the little pill that has been concocted for Memorandist, and thoughtfully coated with lavish hand. In the "Memoranda" for Feb. 6 and March 6, mention was made of some puerile allegations in the "Electrician" concerning the gas industry's operations; and in regard to the questions which we put to our contemporary on the main points, it is observed that it has adopted our advice that, if it could not make straightforward affirmative or negative reply, it had better entirely ignore the inquiries. It has ignored them, and that is precisely what we expected. However, it runs off the main track on to our reference to the National Gas-Engine Company's dividend, which was instanced as showing that the gas-engine industry is still alive and flourishing, and has not been snuffed-out by the electric motor, or its productions utilized only in the "dark corners of the earth." The "Electrician" again refers to Disraeli's "lies, dammed lies," and to things being "contrary to fact." What is the character of the description that our contemporary would apply to the unsubstantiated allegations made by it against the gas industry? But as to the dividends of the National Gas-Engine Company. Our contemporary alludes to the State paying a higher price for shells than ought to be paid, which shows the want of business acumen on the part of the State. This leads up to the point that to bring forward high dividends as proof of prosperity in a particular trade is "sheer [which is a redundancy] unadulterated nonsense," and our contemporary declines to accept such "foolish evidence." Very well. Then let it take the years immediately preceding the war, which are among the richest in profit that the same Company ever experienced. Taking these years, the profits earned and the dividends paid were not what we should describe as "unadulterated nonsense," or "foolish evidence." Better deserving these descriptions are certain of the strange contents of the two paragraphs from the "Electrician" editorial pen which produced our former criticism, and partially also the "Ferocity" editorial, and this rejoinder.

The Public Lighting Prop.

Ratepayers appear to be very patient over the condescension shown to electricity supply undertakings "managed" by their municipal representatives. It may be they know that there is nothing to be gained by protesting; and so they quietly put up with the impositions of their local rulers, which impositions come of the extraordinarily generous treatment of the electricity concern. This treatment has been very prominent during the war while lighting restrictions have been in force. In many cases, payments have been continued for the reduced electric lighting in the streets on the same scale as formerly. Taunton is a case in point. It is confessed there that fresh addition to the prices charged for lighting and power making the war increase 33⅓ p.ct. will not enable the undertaking to make both ends meet. This is due to various causes—to the falling-off in lighting consumption, and, according to the Mayor (Alderman H. J. van Trump), to the Tramway Company having caused a loss to the town for some years, and to certain of the power consumers not being remunerative. And there is this inability to equalize matters, despite the fact that the ratepayers now are being charged by the electricity supply undertaking full price—some £2700—for the public lighting. If what the Mayor says is correct, then there has been gross mismanagement of the concern in making certain contracts in the past. But as to the charge for public lighting, there is not a shadow of doubt about it, seeing that Councillor Mole, the Chairman of the Electricity Committee, admits both its fulness and the shortness of value given in return. The number of the electric lamps in use has been cut down and the number of hours of use has been curtailed, until the sum paid for public lighting, divided by the number of units now used, shows that the ratepayers are being charged something that would not be far removed from 9d. per unit. What would they say if such generosity was shown by their municipal rulers to a private gas or electric undertaking. There would be a fearful hullabaloo about it.

Diesel Misfortunes.

It has recently been announced that the Kingston-on-Thames electricity undertaking, as the burdens of the ratepayers are not sufficiently heavy, has succeeded in putting an additional 2d. in the pound on the rates. Prominence has also been given to the fact that the concern has been unfortunate with its Diesel engines; but things in this respect are really worse than we anticipated. In April last year the crank of the two-cycle Diesel engine was fractured, and the engine is not yet in use. On Dec. 8 the four-cycle Diesel engine broke down, and it could only be used for forty-two hours per week. If we were not so cold-hearted, we should feel extremely sorry for the Kingston-upon-Thames Electricity Department. While there are these unpleasant and suggestive troubles, and while the price of fuel oils is so high, there are people who have sufficient confidence to form a company in Stockholm, with a capital of above £1,100,000, for the express purpose of manufacturing Diesel engines.

Expensive Water Heating.

Among the things that the electricity industry will never be able to do so economically and so expeditiously as the gas industry, is that of heating water. There is a perpetual struggling at the problem, with the same result—a big expenditure of current and time, with comparatively little hot water. The Bastian Electric Company have produced a polished copper urn, of 3 gallons capacity, heated by two "Quartzalite" glowers placed in tubes which pass through the lower part of the urn; the glowers being respectively rated at 250 and 125 watts, so that at full heat the urn is loaded to 375 watts. Tests show that with a loading of 125 watts, 2½ gallons of water at 45° Fahr. can be raised to 120° Fahr. in eight hours; the power consumption being 1 unit. Of the 3420 B.Th.U. thus expended, only 1875 B.Th.U. are represented in the 2½ gallons of water; so that there is a considerable waste of heat by radiation, which cannot well be avoided, seeing the length of time occupied in the heating. With the full loading of 375 watts, the same quantity of water can be raised to boiling point in seven hours; the consumption being 2·62 units. The efficiency in this case is worse than in the previous one. The urn can be connected-up to any lamp holder, so that in addition to the long time taken in heating up, the cost at the lighting rate would be heavy. Consider 2½ gallons of water heated up to 120° Fahr. in eight hours, at a cost of 1 unit, for which anything between 3d. and 8d. might have to be paid in these days. Or 2½ gallons raised to boiling-point at an expenditure of 2·62 units, costing anything between the 3d. and 8d. per unit. At 6d. per unit, this last piece of foolishness would cost 1s. 3·72d.!

Fatal Accidents.

The annual report on Mines and Quarries for 1915 shows that the use by collieries of electric-motors above and below ground is making considerable headway. There is no doubt about the convenience, though the conditions for the use of electrical energy in mines are such that the risks are intensified compared with its use in more congenial surroundings. The rated capacity of the motors at the end of 1915 was 804,731 H.P., compared with 713,782 H.P. twelve months before. The coal-cutting machines in use at the end of 1915 numbered 1449—an increase of only 34 over the number at Dec. 31, 1914. But these particulars hardly come appropriately under the side-heading to this paragraph. What does come appropriately is that during the year there were twelve fatal accidents definitely traced as having been due to electricity. One man was altering the position of an electric-lamp, and supposed the pressure of the current to be at 220 volts, instead of which the pressure was 500 volts. He was killed. In another case a man working a coal-cutter at a wet spot had a fatal shock owing to a fault on the trail cable. Similarly a machineman met his end through a fault occurring in the motor of a coal-cutter which, owing to the absence of a locking-pin to connect the earth conductor in the trailing cable to the frame of the machine, caused the frame to become charged. Result, a fatal shock. It was part of a chargeman's duty at another colliery to start and discontinue a 10 H.P. motor pump, three-phase, 300 volts. He went to stop the pump on the day of his death; and three hours later was found lying near the switches quite dead. In a South Wales colliery a man received a fatal shock by taking hold of a range of steel tubing carrying electric lighting cables along an underground road; the pressure being 220 volts. The tubing had become electrically charged owing to the insulating braid having been punctured. These are instances of the quick passing from life into death, through electrical agency, and notwithstanding Home Office rules and regulations.

Mr. William Evans, of Messrs. Joseph Evans and Sons, of Wolverhampton, who died at the beginning of this year, left estate of the gross value of £209,000, with net personalty £201,221.

AN UNCONVENTIONAL CHEMISTRY PRIMER.*

Mr. Kingzett, as a well-known industrial chemist, with early experience of lecturing on chemistry, and author of several technical manuals, is in a position to prepare a primer of chemistry on novel lines, since the authors of nearly all the existing *brochures* for chemical students labour under the disadvantage of viewing chemistry only from the teacher's side of the lecture-table. Mr. Kingzett has availed himself well of the better qualifications which his position affords him in the preparation of the compact little volume which is now before us. In it, he has departed from the traditional type of chemistry primer, in which the professional teacher usually contrives to render the most attractive of all the sciences singularly unpalatable to the beginner.

Mr. Kingzett is alive to the importance of each and every schoolboy acquiring an elemental knowledge of chemistry; and we think his little book is better adapted than others of similar scope known to us to impart such knowledge to the dull as well as to the quick-witted pupils of our elementary schools. It should be useful also to those who have passed through these schools without gaining any acquaintance with chemistry, and now in later life wish to repair the serious disability under which they consequently labour. In this respect, it may well appeal to some employees of gas undertakings; and gas managers may be glad to recommend it to youths at their works who wish to "improve themselves" by studying chemistry.

There are many good and original features in the little book—notably the combined dictionary and index which forms the fourth part of it. We hope, however, that when the author has occasion to revise his work, he will include in this dictionary-index a number of terms which he uses in the text without adequate explanation. Among these, we may mention "hydrocarbon," "acetylene," and "cyanide." Omissions of this kind must be unavoidable in the first issue of such a primer; and we do not wish to suggest that the general usefulness of it is seriously impaired thereby.

* "Chemistry for Beginners and for Use in Primary and Public Schools." By C. T. Kingzett, F.I.C., F.C.S., Past Vice-President, Society of Public Analysts, &c. London: Baillière, Tindall, and Cox; 1917. [2s. 6d. net.]

BRAYSHAW FURNACE DEMONSTRATIONS.

An excellently equipped test and demonstration room for steel and other research work—of which a great deal is being carried out there—has been provided at their Mulberry Street Works, Hulme, Manchester, by Brayshaw Furnaces and Tools Ltd. (who are associated with John Wright and Eagle Range, Ltd.); and it is not surprising to learn that the facilities offered by the firm, who also have a demonstration room at Sheffield, are taken advantage of by people from all parts of the country. Important experimental work is being undertaken for the Government, and for many well-known contractors; and customers generally are able to go and see their own work treated.

Referring specially to the recently fitted Manchester demonstration room, mention may be made of some of the new types of gas-furnaces installed there, taking first the Brayshaw patent "Lopress regenerative" annealing furnace. With this, a reducing, neutral, or oxidizing atmosphere can be secured at will; and it is claimed that the "greasy" flame so essential for much annealing work may be produced to perfection in this furnace. Features of the design are that it is impossible for the combustion to take place in any but the correct way; that, owing to solid construction, the floor of the furnace is capable of withstanding heavy weights without damage; and that it can be heated up remarkably quickly. Gas is used at ordinary town pressure, and air at from 4 to 8 in. water-gauge pressure—only a fan being thus required. The air supply, it is pointed out, is subjected to true regenerative action, as distinguished from mere preheating by a cold air jacketing arrangement.

In the next place, there is a crucible melting furnace, fitted with the Wright-Brayshaw patent burner, capable of melting cupro-nickel at double the rate of coke-fired furnaces; the pots lasting 50 p.ct. longer. This was the furnace to which Mr. G. B. Brook (Lecturer in Non-Ferrous Metallurgy in the University of Sheffield) referred in the paper presented by him at the annual meeting of the Institute of Metals, and abstracted on p. 599 of last week's "Journal."

Work tested in a brick-testing furnace for refractory material has actually measured 1800° C. Then there are a blast-heated case-hardening furnace with solid floor, arranged to bear heavy weights; a new type of salt bath furnace for the hardening of carbon steel, and for the heat-treatment of special air-craft and similar steels; natural draught oven and muffle furnaces for annealing, case-hardening, &c.; and forging furnaces for all classes of work. There are also specimens of the twin-chambered high-speed tool-furnaces, for which the firm have experienced a very large demand from tool-makers, railway companies, and national factories.

For the carrying out of the different tests, accuracy is ensured by the provision of the latest types of measuring instruments; and in every way the Brayshaw demonstration rooms are calculated to help the gas industry as well as to assist the firm. Particularly is this so, as we are assured that the latest types of furnaces installed are, in the heat-treatment and annealing of steel, the melting of metal, and other processes, giving results hitherto considered impossible with gas fuel.

OUTPUT OF COAL IN THE PAST YEAR.

The customary preliminary official figures with regard to the output of coal in the United Kingdom, in connection with the year 1916, are contained in a White Paper issued at the beginning of last week. This shows the estimated quantities of coal raised in each quarter of the past year, and compares them with the corresponding periods of 1915 and 1914. From the particulars given, it appears that the quantity of coal raised last year was 255,846,000 tons; the figures for 1915 being 253,179,000 tons, and for 1914 265,643,000 tons. Thus, 1916 shows an increase of 2,667,000 tons, or 1·1 p.ct., when compared with 1915, but a decrease of 9,797,000 tons, or 3·7 p.ct., on the quantity raised in 1914. Calculations based on returns furnished to the Coal Mining Organization Committee indicate that the number of persons employed at coal mines was 1·9 p.ct. more in 1916 than in 1915, but 13·2 p.ct. less than in July, 1914. Of the output of 255,846,000 tons last year (which includes coal used for colliery purposes), there were 42,013,000 tons (including the coal equivalent of coke and manufactured fuel) exported, which left 213,833,000 tons available for home consumption—including coal for use by the Admiralty, or as bunker coal in merchant ships. As a matter of fact, the last-named figure includes 12,988,000 tons shipped for the use of steamers engaged in foreign trade. After deducting the exports, the amount available for consumption was in 1915 206,857,000 tons; and in 1914 203,185,000 tons. That is to say, in 1916, with an output nearly 10,000,000 tons less than in 1914, there were over 10,500,000 tons more available for home consumption and bunker coal than in the earlier year.

The Late Mr. T. E. Priestman.

At the funeral service on the late Mr. Thomas E. Priestman, which took place at the Golders Green Crematorium last Tuesday, the firm of Messrs. R. & J. Dempster, Ltd., of Manchester (with whom the deceased gentleman had been so many years connected), was represented by Mr. Charles Dempster and Mr. J. W. Scott. There were also present Mr. E. H. Woodmancy, Chairman, Mr. Worthington Church, a Director, and Mr. F. M. Paternoster, the Secretary and Manager, of the Felixstowe Gas Company, of which Mr. Priestman was Vice-Chairman. There were also present the W. M. elect of the Evening Star Lodge, Mr. A. P. Main, and Mr. Glover Clark, of the firm of Glover and Main, Ltd., of Edmonton.

Installation Meeting of the Evening Star Lodge.

Last Wednesday the annual meeting of the Evening Star Lodge, No. 1719, was held at the Freemasons' Hall, London, W.C., when Bro. Archibald P. Main was installed in the chair by the outgoing Master, W. Bro. J. Fred. Wicks. Subsequently the following officers were appointed and (those present) invested:

S. W.	W. Bro. Fred. J. West, P.M., 3053.
J. W.	W. Bro. H. W. Packham, P.P.G.D., Surrey.
Treasurer.	W. Bro. F. W. Cross, P.M., L.R.
Secretary.	W. Bro. Walter T. Dunn, P.M., L.R.
S. D.	Bro. Corbett W. Woodall.
J. D.	Bro. Alfred C. Beal.
Dir. of Cer.	W. Bro. A. E. Croager, P.M., P.P.G.D., Kent.
Organist	Bro. John F. Simmance.
I. G.	Bro. Charles Clare.
Stewards.	W. Bro. R. W. Foster, L.R. Bro. Frederick L. Schofield. Bro. Frank Jervis.

During the proceedings sympathetic references were made to the absence, through indisposition, of the Secretary (W. Bro. Dunn), and to the death of W. Bro. Thomas E. Priestman, L.R., who was initiated in the Lodge in 1885, and served the office of Master in 1899. Bro. Rae P. Normand is carrying out the duties of Secretary during Bro. Dunn's illness.

Gas-Mantle Lamp Ratings.—The Washington Bureau of Standards (in co-operation with the American Gas Institute) has been making an experimental study of the conditions which must be taken into account in the rating of gas-lamps. This is a new undertaking, as ratings of gas-lamps have not heretofore been standardized, as have the ratings of electric lamps. The investigations include measurements of the candle power and efficiency over a wide range of gas consumption for several types of lamps at different gas pressures. Measurements have also been made to compare the efficiencies obtained in burning natural gas with those given by manufactured gas, and to compare the results of using manufactured gas of varying composition, falling within legal requirements.

COAL WASHING.

Professor Henry Louis, Lecturer in Metallurgy at Armstrong College, University of Durham, delivered a lecture on "Coal Washing" before the members of the Northumberland and Durham Association of Coke-Oven Managers in Newcastle on Saturday evening.

The lecturer dealt with four principles of coal washing, and avoided saying anything on the question of cost, though he fully realized its importance. With the aid of diagrams he showed numerous methods of separating coal and dirt. All the separations would, be said, be fairly easy if they had nothing but clean coal and clean dirt to deal with; but the great difficulties came when they had particles consisting partly of coal and partly of dirt. Obviously it was no good crushing the coal to small—and this cost money—and making it clean, unless they were going to get a better price for the coke. The dirt would always carry a certain amount of coal with it. Any complete method of coal washing must be one whereby they first of all washed in such a way as to produce an economically clean coal and clean dirt. A point of great importance in coal washing was concerned with sludge, of which there was always a considerable quantity. Sludge, he remarked, then was most valuable from the coke-maker's standpoint. The most satisfactory method he knew of was by air-blowing the coal before they intended to use it. So far as he knew, this method had not as yet been used in this country. Where people had any difficulties in coke making, they would probably find that a properly-designed washery would solve all their difficulties.

SMELTING AND ASSAYING BY GAS.

Some American Figures.

The statement is made by Mr. C. E. Gray, jun., writing in the "American Gas Engineering Journal," that an industrial fuel installation comprising some interesting and unique features, has been placed in the United States Assay Office in Boise (Idaho) by the Boise Gas Light and Coke Company.

The equipment consists of three large crucible furnaces, built by the American Gas-Furnace Company, and two cupelling furnaces, all connected and fired by a gas and air blast. The crucible furnaces are used for the melting of gold and silver ore and bullion. The ore, when ready to be melted, is placed in the crucible, and then closed-in the body of the furnace to be used and the gas blast turned on. In one of the furnaces $25,000 worth of gold ore can be handled in a melting, and raised to the required heat—2000°—in 45 minutes. The gas consumption required for this is only 150 c.ft. Upon reaching the necessary heat, the slag rises to the top, and is poured off. The heavy gold settles to the bottom, and is allowed to cool to a solid lump, or else form into brick in the bottom of the crucible.

After the gold or silver ore has been smelted and reduced to a solid metallic form, it is necessary to assay it to determine its consistency. A small hole is bored into the brick, and the borings carefully placed in a round, pan-shaped receptacle, about an inch in diameter, called a cupell. This cupell, with its gold or silver filings, is then put in one of the cupelling furnaces, the gas blast turned on, and the gold reduced to a molten state; the impurities being absorbed into the small cupell, leaving a small pellet of pure gold. The percentages of gold and other ingredients are then computed by weight to complete the assay.

This installation has been used for some time by the Government office, with a great deal of satisfaction, replacing the old type of coal-furnace. The annual gas bill, with a rate of $1·50 per 1000 c.ft., amounts, approximately, to $225. The saving in labour, time, and cleanliness is so satisfactory that it practically offsets the annual cost of operation. Over $1,000,000 worth of gold and silver ore is treated annually in this efficient manner by these furnaces.

Making a Market for Coke.—The "American Gas Engineering Journal" observes that the disposal of coke is becoming an increasingly important factor in the gas business, by reason of the extensive displacement of carburetted water gas by that produced from coal, and the growing appreciation, on the part of gas companies, of the bye-product coke-oven as a gas producer. Several gas companies have developed a local domestic market by treating and handling the coke in such a manner as to adapt it to domestic use; but it is urgent that the gas industry as a whole should take up the matter with a view of teaching the public to use coke for every purpose to which coal is now applied. If coke can be advantageously used for the generation of steam, it is very much the business of the gas industry to show electricity supply companies and others how this can be done. There is also the possibility of using coke, perhaps as a mixture, for the furnaces of railway locomotives and steamships, which serves to emphasize the fact that the day is near when the gas industry must, for its continued prosperity, establish a large central research laboratory for the investigation and elucidation of these and many similar problems. The domestic line of business, however, is immediately available; and this without any special organization or expense. It could be secured by wide-spread educational publicity, and retained by intelligent treatment and preparation of the coke, according to requirements.

RESINOUS WOODS AS GAS-MAKING MATERIALS.

Arising from the report last year of a Committee of the French Professional Gas Syndicate, on the practicability of employing wood in part replacement of coal in gas making [see "Journal," July 11, 1916, p. 69], the "Journal des Usines à Gaz" published in a recent issue some extracts from a communication recording results of trials on a working scale in a gas-works of the Landes. The wood used was the sea pine (*Pinus maritima*) in the form of billets of about the thickness of a man's leg and cut from the middle of the trunk. The billets were made up into bundles (secured by iron wire) each of a size to fill a retort. The charge of wood was about half the weight of that of coal, and carbonization occupied about half the usual time. When running one retort with wood to every two with coal, no appreciable difference in the calorific power of the gas was noted. Of the two bye-products—small coke and tar—the former amounts to from 5 to 10 p.ct. The coke should rightly be extinguished—a course which the arrangement of the retorts in a gas-works does not permit, as it is necessary to discharge it on the retort-house floor and shovel it into the extinguisher, involving extra labour as well as loss by combustion. The alternative, of quenching with water, is a delicate operation, requiring very careful adjustment of the quantity of water used.

The tar from the combined distillation of wood and coal is much lighter than common tar, and is more difficult to separate from water in the condenser. Owing to the acid character of certain of the products of the distillation of wood—*e.g.*, acetic acid—trouble may be caused in the condensing plant unless the proportion of coal is sufficient to yield ammonia in the quantity necessary to neutralize the acids. The yield of gas from the wood was found to be substantially equal to that from coal; and on this basis the following figures for the relative cost of the two raw materials are quoted:

Wood.—Cost per tonne, 40 frs.; transport, 7 frs.; labour in wiring into bundles, 4 frs.; coke for heating bench (200 kilos at 85 frs. per tonne), 17 frs. 50 c.—total, 68 frs.; less 50 kilos of small coke (at 180 frs. per tonne), 9 frs.; net cost, 59 frs.

Coal.—Cost per tonne at works, 115 frs.; less 500 kilos of surplus coke, at 85 frs. (42 frs. 50 c.) and 40 kilos tar, at 50 frs. (2 frs.); net cost, 70 frs. 50.

Labour and other charges were found to be practically the same in each case.

COKE-OVEN GAS IN AMERICA.

In a paper on the "Bye-Products from the Distillation of Coal," which he presented to the Syracuse Section of the American Chemical Society, Mr. W. H. Blauvelt, Consulting Engineer to the Semet-Solvay Coke-Oven Company, said that in the early days of the soda industry there was difficulty in obtaining regular supplies of ammonia. The coal-gas plants were about the only source of supply; and many of their owners had to be persuaded to recover the ammonia, which had formerly been running to the sewers. In order to secure a sufficient and reliable supply of ammonia, the Solvay Process Company brought to the United States from Belgium the first plant of bye-product ovens; and they were started in 1892, carbonizing a little over 100 tons of coal per day.

This was the small beginning of the present bye-product coke-oven industry, which carbonized last year over 26,000,000 tons of coal, and is now established on a basis of permanency which ensures to the chemical manufacturer an ample supply of raw materials. There are 44 plants now in operation, having an estimated capacity of about 29,000,000 tons of coal per annum, and 18 plants under construction, with an estimated capacity of about 15,000,000 tons per annum. Ten years ago, the output of bye-product coke per annum was still below 5,000,000 tons; while the production in 1916 was nearly 20,000,000 tons, and present construction will much increase this output. As to the future supply of benzol, practically all the 62 oven plants in operation or under construction are equipped to recover benzol; and on a reasonable estimate of yield per ton, the annual production of benzol will be over 50,000,000 gallons.

In most bye-product oven plants, said Mr. Blauvelt, a portion of the gas produced in the distillation of the coal is utilized for heating the ovens; but about 60 p.ct. of the total amount produced is ordinarily available for other uses. On the completion of present constructions, this surplus will amount to 200 billion cubic feet per annum. Most of this gas is used as fuel in industrial plants; but about forty cities and towns in the United States rely for their supply of domestic gas entirely, or in large part on the bye-product oven. As the advantages of the calorific standard for such gas, as compared with the candle-power standard, obtain still wider recognition, the use of coke-oven gas for domestic purposes will correspondingly increase. Bye-product oven plants are usually constructed in large units; and as the domestic consumption of oven gas becomes more widely established, the result will naturally be the production of gas in large quantities at central points, with distribution through high-pressure pipe-lines to the surrounding communities.

The distribution of natural gas in America has developed the art of high-pressure delivery over long distances far beyond any similar development in Europe. For some years oven gas has been distributed, from one plant at least, to points as much as 90 miles from the place of production. This development is but another illustration of the tendency to concentrate manufacturing industries in large units, which

permits the application of the highest grade of management and engineering skill.

In connection with the utilization of the gas from bye-product ovens in municipalities, it is interesting to note the application of the gas-producer for heating the ovens. This not only puts the bye-product oven in a position to deliver all of the oven gas produced for sale, as is done in the ordinary coal-gas plant, but it also permits a wide flexibility in output of gas with a given production of coke, by using oven gas or producer gas in whole or in part for heating the ovens. This change in fuel is made very simply, and enables an oven plant to meet without difficulty wide seasonal variations in gas requirements.

PRESENTATION TO MR. ANDREW DOUGALL.

In connection with his retirement from the position of Engineer and General Manager to the Tunbridge Wells Gas Company, Mr. Andrew Dougall was on Monday of last week presented, by the employees and staff of the works, with a silver epergne, appropriately inscribed, and an illuminated address.

In making the presentation, Mr. Cockburn (the Chief Assistant) expressed the regret of all present at Mr. Dougall's retirement, especially as this was necessitated by ill-health. He referred to the happy relations which had existed between Mr. Dougall and those working under him, which was largely due to the considerate way in which Mr. Dougall had treated them. They always felt that they were sure of a sympathetic hearing, and had found him ready to help and encourage them in their work. He spoke of the high esteem in which Mr. Dougall was held by all ranks; and while everyone was sorry to lose so good a chief, they hoped that relief from the worries and responsibilities of his position would result in a renewal of health and strength, and that he would enjoy for many years the rest and leisure he had so well earned. Mr. J. B. Richardson and Mr. D. T. Livesey also spoke in the highest terms of the great respect everyone felt for Mr. Dougall.

In thanking those present for their good wishes, Mr. Dougall remarked that they had quite taken him by surprise. He would number the gifts with which they had presented him among his most treasured possessions—not only for their intrinsic value, but because of the good feelings which had prompted them. Though he had been at the works for 36 years (a considerable part of his life), it seemed but a short time since he came to Tunbridge Wells. He trusted that they would be as loyal to his successor (Mr. L. J. Langford) as they had been to him.

The Gas Chemist's Handbook.

The Chemical Tests Committee of the American Gas Institute have devoted the past three years to the task of compiling and editing a "Gas Chemist's Handbook." The result has been the issue of a work which the Institute feel comprises their most important and useful contribution to the technical literature of the gas business, for the need of an authoritative handbook on the matters dealt with has long been recognized. Each subject treated has been submitted to prominent chemists throughout the United States; and it is therefore claimed that the completed work represents the advanced thought of the industry on standard laboratory methods on the entire field of chemistry as applied to the gas business. Acknowledgment has to be made of the receipt of a copy of the book from the Institute; and this will be reviewed in the "JOURNAL" pages in due course. Meanwhile, those desirous of taking the earliest opportunity of seeing the book for themselves should send $3·75 to Mr. Geo. G. Ramsdell, the Secretary of the American Gas Institute, at No. 29, West 39th Street, New York. The sum named covers the cost of the book and postage to this country.

Calorific Standard Order.—The Local Government Board have made the Order asked for by the Borough of Keighley, with a standard of 500 B.Th.U.

Three Months Gas-Coal Contracts.—The "Coal and Iron Trades Review" says "the impression seems to prevail in some quarters that gas-coal contracts are not included in the recent order of the Controller of Mines with respect to three months' contracts. This opinion is inaccurate; the order being issued at a period when gas-coal contracts are arranged, to make the position clear to the gas authorities." Then our contemporary goes on to quote the announcement made last week in our columns (p. 591) as the result of the interview Mr. D. Milne Watson, the Chairman of the Executive Committee of the National Gas Council, had with the Coal Controller, which "result" supplies an important qualification to our contemporary's statement.

Distribution of Coal.—It is announced that Mr. Guy Calthrop the Controller of Coal Mines, is endeavouring to relieve the pressure on the railways by arranging for the transport of more of the coal traffic by the canals. The main idea is to confine the distribution of coal as near as possible to the locality in which it is produced. As matters now stand, coal which could easily be sold and distributed locally is diverted to distant parts of the country, and empty wagons make journeys which in every interest should be avoided. To expedite the business of the Controller's Department district superintendents are being appointed. One will reside in each colliery area; and it will be his business to solve problems on the spot on lines laid down from headquarters, thus avoiding endless correspondence and delay.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Government Prices for Benzol, &c.

SIR,—I was sorry to see that the "JOURNAL" subscribes to the (in my mind) very unpatriotic views of Mr. Livesey, as contained in his letter to the Secretary of the National Gas Council.

If I understand it aright, Mr. Livesey is of opinion that because large numbers of traders have been able, owing to the abnormal times, to force up the price of their commodities or of the service they render, and thereby make extraordinary profits, the gas companies should depart from the high standard of conduct hitherto observed, and come in and scramble for some of the "pickings." It must be admitted by everybody that the present abnormal charges for food, coal, freight, &c., are not right, considering that at the present moment excessive prices that are due merely to supply and demand should not exist. I think it is very improper to suggest that gas companies who are now behaving in a reasonable way should endeavour to obtain unreasonable prices or extra prices for certain national necessities required by reason of the war, which, in most cases at least, would not have been thought of or dealt in.

I feel impelled to write this letter so that it should not go out that all gas undertakings are in sympathy with the views expressed by Mr. Livesey, since there are some of us—we may be few, and we may stand alone, though I hope not—whose chief desire is to deal fairly and reasonably with those with whom duty compels us to have dealings in this connection. In these critical days our motto should—nay must—be "All for State, and no one for himself."

L. TREWBY, Engineer and Manager.

North Middlesex Gas Company, Finchley, N.,
March 30, 1917.

[A comment on the above letter appears in the editorial columns to-day.—ED. G.J.]

The Revision of the Sliding-Scale.

SIR,—I agree with your correspondents that Mr. Paddon's suggestion is far too modest. If the sliding-scale be not giving "even justice," clearly more than "relief" is required.

It may in the long run be of less vital importance to be helped over war-time difficulties than to secure the confidence of gas investors in the "even justice" of legislation respecting gas dividends, and this quite as much in the interest of gas consumers as of others.

Whatever may be said as to the fairness of the sliding-scale working under normal economic conditions such as existed at the time of its institution, it is plain that once legislation has interfered with these conditions, the working of the sliding-scale must be unfair.

Exceptional war-time Government control of industries has merely accentuated the results of such interference, and by abnormally increasing the cost of gas manufacture has emphasized the defects of the sliding-scale. But pre-war legislation—*e.g.*, the Mines Acts and Eight Hours Act—had already in some degree done so; and it was obvious enough that legislation had had the effect of permanently raising the cost of the principal raw material of gas manufacture, and hence of gas itself. Therefore, as has been previously pointed out, some alteration of the sliding-scale should, in justice, have been made to enable the extra cost to be passed on as in all other industries. Failing that, the gas industry must be permanently unfairly injured, and its investors discriminated against in a way no others are. These grounds are as solid as ever; post-war legislation may consolidate them.

The principle that parliamentary interference with economic conditions gives investors a right to redress was tacitly admitted by the action of Parliament in respect to the Railway Companies at the time of their labour difficulties. The gas industry has a far better claim than had the railway industry.

I make no excuse for emphasizing this view of the situation, because, while the war-time conditions will end with the war (or soon after, it may be hoped), legislative interference with "economic conditions" may possibly then be more frequent and extensive than ever. If therefore anything is to be done to secure modification of the sliding-scale, this possibility should be provided for by obtaining recognition of the right of redress.

J. KELLY.

Bridlington, March 28, 1917.

The Proposed Use of the "Lumen" as a Lighting Unit.

SIR,—At the present time there is a proposal before those concerned with the manufacture and sale of lighting units to rate lamps in terms of a new unit termed the "lumen" [*vide* "Illuminating Engineer," Vol. X., No. 1].

It is stated on p. 16 of the above volume that the lighting value in lumens of any lamp or luminous source is obtainable by multiplying the mean spherical candle power of the source by 12·57. In the opinion of the writer, the fact that the number associated with any given lamp is larger when expressed in terms of the new unit than in terms of the more familiar "mean spherical candle power," constitutes the sole claim to preference that can legitimately be urged on behalf of the suggested new unit. There can be little doubt that even this claim to preference rests on no scientific basis, and is dictated solely by commercial considerations, as indeed is naively admitted by Prof. J. T. Morris in the opening remarks at the discussion: "The adoption of this—*i.e.*, mean spherical candle power—for horizontal candle power would lead to the presentation of lower numerical values than those previously put forward, which from a commercial standpoint is objectionable."

The further criticism of Prof. Morris—that "the mean spherical candle power is only an imaginary quantity"—is a specious argument,

as it is not difficult to show that the lumen, representing as it does a light flux, is possibly even more imaginary and difficult of conception. Whatever objection can be urged against the rating of lamps according to mean spherical candle power can be urged with even greater potency against the rating in terms of the lumen.

Although the author of the paper, Mr. F. W. Willcox, rather cavils at the employment of the Rousseau diagram—speaking of "such complications" as Rousseau diagrams, &c.—it is not without interest to remark that on pp. 23 and 25 the necessary calculations to determine the lumen value are made in a lengthy manner, which in effect achieves what is achieved by the Rousseau diagram far more elegantly and with less labour.

The main purpose, however, of the writer of this note is not to advance criticism derived from a comparison of the use of the lumen and of mean spherical candle power. It is rather to get down to fundamentals, and to point out that in the proposed use of the lumen as the unit, we should be falling into an error exactly similar to one from which electrical theory has suffered. The exact analogue of luminous flux is found in what is termed flux of force in electrical theory. According to Gauss' theorem (one of the fundamental theorems) the total flux of force across any area enclosing a charge e is $4\pi e$. The occurrence of the factor 4π is entirely due to the choice of the unit of electrical charge. Those familiar with electrical theory will know that the factor 4π, owing to the choice of unit, keeps cropping-up in practically all the formulæ of electrical theory. In the mind of the "average person," π has to do with the circumference of a circle; its obtrusion into electrical formulæ has been a difficulty with many. "Que diable fait π dans cette galère."

An attempt initiated by Oliver Heaviside, and supported by many others in the forefront of electrical theory, has been made to revert to rational units in electrical theory. As Heaviside has pointed out, the factor 4π is irrationally introduced by the use of a sphere of unit radius as the unit of area, in place of a square of unit length of side. The only trouble in reverting to "rational" units, is the fact that usage has familiarized most with what may be called irrational units. If, then, we must introduce the new unit, the lumen, the writer would plead for its definition in such a manner that the flux of light produced by a source of mean spherical candle power C, is C lumens, and not 4πC lumens, as suggested by the writer of the paper quoted. In this manner we should avail ourselves of the experience gained by those familiar with electrical theory, and bring ourselves into line with the growing school of users of rational or Heaviside units in electrical theory, who define the flux of force from a charge e as equal to e units.

J. S. G. Thomas.

South Metropolitan Gas Company,
Old Kent Road, March 27, 1917.

Income-Tax Assessments on Subscriptions and Donations.

Sir,—During the years 1915 and 1916 my Directors have granted various sums to institutions which have been largely working in connection with the war. Assuming these items would be allowed from profits when compiling the usual annual figures for income-tax purposes, I wrote the local Surveyor accordingly, but am informed "that subscriptions to charities whether in connection with the war or not are not admissible for purposes of income-tax. The only exception is where the employees of the subscriber stand to benefit by the subscription."

Seeing that the subscriptions referred to are those of such institutions as the British Ambulance Committee, the British Red Cross Society, and similar causes, and also recognizing the fact of the large percentage of male employees now serving in H.M. Forces who it is possible may be enforced to the benefit of these Societies, I would have thought, looking broadly at the circumstances, that the items I have made mention of would have readily been allowed.

As it is probable some of your readers may have had similar experiences, I would be interested to learn with what result.

Enquirer.

March 31, 1917.

Price of Gas Increased at Chelmsford.

In a report which was adopted at the last monthly meeting of the Chelmsford Town Council, the Parliamentary Committee stated that the estimated expenditure on the gas undertaking for the ensuing year was £6093; while the estimated profit on the working was put at £5196, leaving a deficit of £897. If the gas concern was to be free of any charge on the rates, it would be necessary to increase the price of gas not less than 2d. per 1000 c.ft. The Committee therefore recommended that the gas supplied by ordinary meter be increased 2d., subject to a discount at the rate of 1d. per 1000 c.ft. on all accounts paid within one month of the date of the accounts; the rebate of 2d. per 1000 c.ft. now allowed to users of slot meters to be discontinued. Alderman Taylor, in moving the adoption of the report, said the Committee regretted that they had to ask for the price of gas to be increased. The profit derived for the last year was only £5196, compared with £7314 in the previous year. This was largely accounted for by the increased cost of coal. The Company had a stock of coal which lasted until September, 1915; but since then they had to buy coal at an increase of 6s. per ton. Mr. Leech asked whether the price of gas would have been increased if the Corporation had not taken over the gas-works; and Alderman Taylor thought there was no doubt it would have risen.

J. & W. B. Smith, Limited.—The old-established business of J. & W. B. Smith, Limited. has been registered as a private limited company, with a capital of £70,000 in £1 shares. There has, however, been no change whatever as regards the firm. The late Mr. J. G. Watkinson managed the firm for Mr. W. B. Smith for many years, and ultimately purchased the business from him in its entirety. Upon his death, his brother, Mr. Frederick Watkinson, took over the management; and he continues to direct the concern.

REGISTER OF PATENTS.

Control of Draught Current for Gas-Producers.

Riter-Conley Manufacturing Company (Assignees of H. A. Carpenter of Sewickley, U.S.A.)

No. 17,256; Dec. 8, 1915.

One of the objects of this invention is to operate a producer in conjunction with coal-gas generating apparatus, so that the gas will have a substantially uniform heating value, and thus there will be no sensible temperature variations within the retort-bench.

In the preferred mode of carrying out the invention, the unstable conditions resulting from the varying humidity of the air in the draught current is compensated for by maintaining it at any desired uniform temperature slightly above the maximum atmospheric temperature, and then uniformly saturating it at such temperature as to prevent condensation before the draught current enters the producer. A maintained temperature slightly above the maximum attained in the hottest weather—say, 100° Fahr.—is sufficient to forestall variations arising from natural causes. The temperature of the saturated current may be utilized for automatically maintaining such a mixture of currents of different temperatures as to insure the delivery of a draught current of predetermined temperature and saturation.

A sheet of closely-lettered detail drawings accompanies this specification; and twelve separate claims are made for the invention.

Gas Heating Stove.—No. 100,114.

Fleischer, J., and Haegele and Zweigle, of Stuttgart, Germany.

No. 2749; Feb. 24, 1916.

This gas heating-stove is of the kind described in patent No. 3433 of 1914, in which a front, a middle, and a back group of heating pipes are provided—each group formed by any desired number of heating pipes constructed alternately as ascending and descending passages for the exhaust gases. A chamber is arranged in the lower part of the stove which connects the middle with the back group of heating pipes, and has a bottom which is heated by the burner flame. It is provided on the under side with open, and on the upper side with partially covered, longitudinal passages; while an intermediate chamber in the upper part of the stove conveys the exhaust gases from the front into the middle group of heating pipes. A guide wall or partition above the conveying chamber forces the exhaust gases to sweep over the top of the conveying chamber before escaping to the chimney.

Annealing Furnaces Heated by Gaseous Fuel. No. 103,593.

Alldays and Onions Pneumatic Engineering Company, Ltd., and Allday, P. W., of Birmingham.

No. 7117; May 18, 1916.

The annealing furnace constituting this invention has in cross section an arch-shaped crown or roof for the annealing chamber, with provision for heating the chamber by a series of preferably equidistant bunsen burners or blast burners at each side—the flames being directed through holes or openings immediately below the arch of the roof. Passages are made in the floor of the chamber along the opposite sides for the escape of the heated air and products of combustion, which are conducted to longitudinal flues beneath the floor of the chamber, through which passages the air supply pipes for the burners pass. The products of combustion, after passing along the flues and impinging on the air supply pipes (thereby heating the latter), ascend a number of vertical flues in the side walls of the chamber and enter other horizontal flues in the upper parts of the side walls adjacent to the gas supply pipes which are built in the walls of the furnace. The products of combustion finally escape by a damper controlled chimney in connection with the last-named horizontal flues. Both the air and gas are pre-heated before entering the burners; the supply pipes adjoining the flues through which the gas and heated air pass to the burners.

Gas Cooling Apparatus.—No. 103,917.

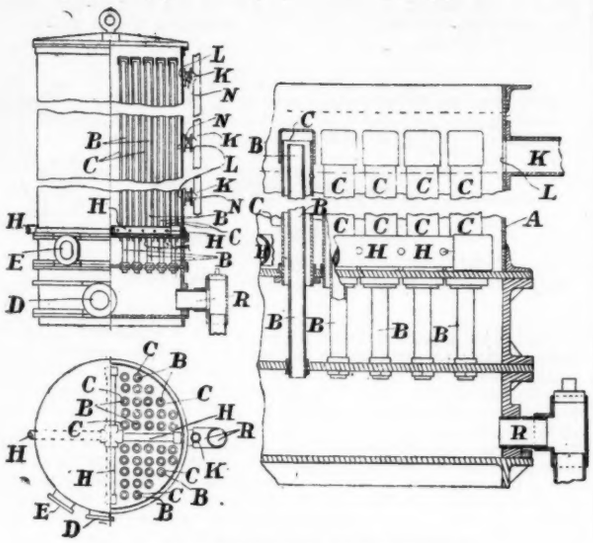
Christopher, J. E., of Hindley.

No. 6087; April 28, 1916.

In this apparatus for cooling gases, units or groups of tubes are provided, each in concentric form and supplied externally with water, so that, whatever the number of units, neither the total cross sectional area of the inner tubes, nor the cross sectional area of the concentric spaces between the inner and outer tubes, shall be substantially greater than the total cross sectional area of the main gas delivery pipe—that is, the areas compared are approximately equal, and the incoming gas is thus "more desirably divided among the cooling units or groups."

A part section and part elevation, a half plan and a half cross section, and a portion of the plant on an enlarged scale are given.

Within the shell of the apparatus are mounted concentrically inner tubes B and outer tubes C. D is an inlet for the gas, which passes through the open ends of the tubes B, and emerges at the upper ends, after which it passes down between the inner and outer tubes forming each concentric group. On emerging from the lower end of the outer tubes the gas passes out at E. The cooling medium is supplied through a four-way pipe system H, provided with holes through which the water may pass or be forced. The water level about the groups may be maintained by an overflow pipe K. Outlets are shown at L; and the pipe K is provided with valves at N. The groups of tubes through which the gas passes are thus immersed in the cooling medium; and



Christopher's Gas Cooler and Condenser.

the gas also is divided into thin films or parts within the tubes. R is a pipe leading to a tar well or the like, and in connection with a water seal.

The total cross sectional area of the tubes B should be approximately equal to that of the inlet pipe D; and the same applies to the total cross sectional area of the spaces between the tubes B and C. The outlet pipe E should have a similar cross sectional area. Thus the gas is equally divided among the cooling units without interfering with the ordinary condition of flow as between the inlet D and the outlet E. The arrangement also ensures intimate contact of the gas with the inner surface of the outer tubes by being passed through them in comparatively thin films, while the tubes themselves are kept cool by the cooling medium surrounding them and circulating through the apparatus for the purpose.

Gas Cooking Stoves.—No. 103,853.

Becket, W. H., of Carshalton, Surrey.

No. 2004; Feb. 10, 1916. No. 11,127; Aug. 7, 1916.

This gas heated cooking stove is of the kind wherein the heat is applied at the exterior of a closed oven as distinct from the construction in which the oven is open at the bottom and is directly heated by burners disposed therein—the gases of combustion passing away by an outlet in the upper part.

Means are provided to open a passage for the gases through the oven to the outlet and simultaneously to close the passage for the gases to the outlet through the external flues; and, alternatively, simultaneously to close the passage for the gases through the oven to the outlet, and to open the passage for the gases through the external flues. For this purpose openings are formed in the lower plate or brick of the oven either directly above or adjacent to the heating burners; and in the upper part of the oven there is provided an aperture adapted to serve as an outlet to the main exhaust flue or to an independent flue. Closing valves are provided whereby, when the passage through the oven is closed, the passage through the external flues is simultaneously opened, and *vice versâ*.

Bye-Pass Gas-Burners.—No. 104,047.

Kershaw, H., of Wallington, Surrey.

No. 3820; March 15, 1916.

This invention relates to burners of the inverted or downwardly inclined type, incorporated with a bye-pass for a pilot light; and it has reference to means whereby such burners, together with the bye-pass tube, can readily be removed for cleaning—the movements necessary for the removal of the burner with the bye-pass tube also closing to the atmosphere the aperture which serves to supply the bye-pass with gas.

The bye-pass for the pilot light is connected to a truncated cone fitting forming a seat for the internal cone of a double truncated conical valve, the external cone of which forms the seat for the internal cone portion of the air-mixing tube, provided with a bye-pass tube—the arrangement being such that communication is made from the bye-pass hole in the cock, through an aperture in the valve, to the bye-pass tube only when the air mixing tube is secured in position to the fitting which forms the seat for the internal cone of the valve.

Atmospheric Gas-Burners.—No. 104,051.

Hall, I., of Aston, Birmingham.

No. 4159; March 21, 1916.

This invention, with the object of preventing or minimizing the lighting-back which occurs with some burners of the bunsen type, is carried out by interposing between the nozzle at which the mixture burns and the air inlet a perforated disc, as distinguished from a gauze disc. The disc is secured in position between the adjacent ends of the pipe leading to the nozzle and the pipe or mixing chamber communicating with the air inlets. The section of pipe between the disc and the nozzle may be curved or straight, as required, and the nozzle may be of the form described in patent No. 5888 of 1914.

Effecting Intimate Contact of Liquids and Gases. No. 104,261.

Kirkham, Hulett, and Chandler, Ltd., and Hersey, S., of Palace Chambers, Westminster.

No. 6120; April 28, 1916.

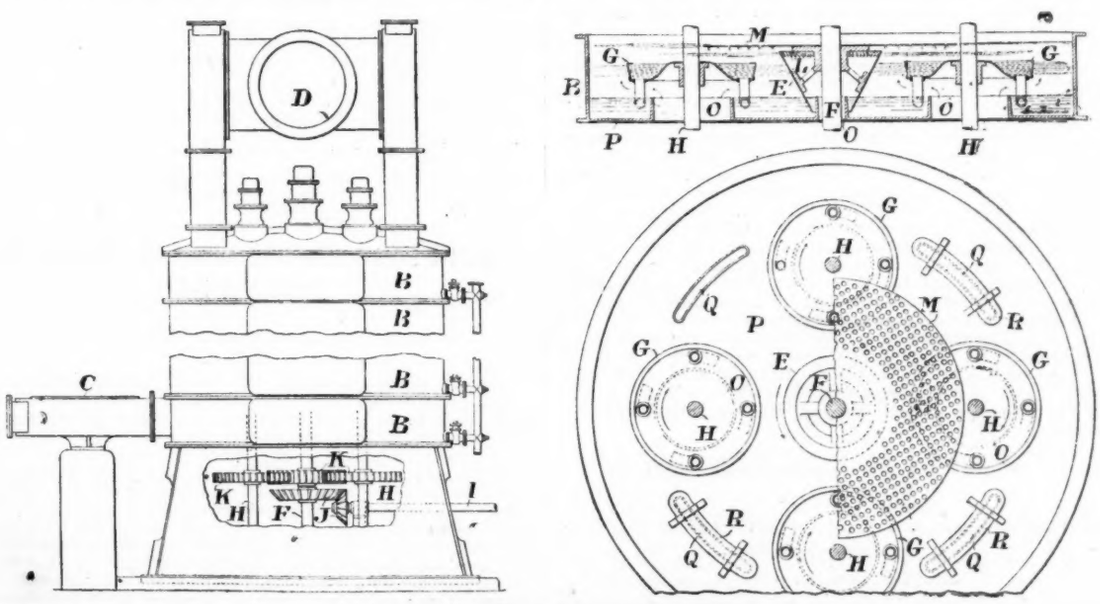
This invention relates to the class of apparatus wherein gas is caused to rise vertically through sprays of liquid discharged by centrifugal action, as described in patent No. 18,129 of 1908—the object being to provide a single apparatus capable of treating a much larger volume of gas than formerly.

A vertical vessel is divided into a series of superposed chambers as heretofore; but, instead of providing each chamber with only a single spraying device, two or more sprayers are mounted upon separate driving shafts, so that the sprays practically form a layer of liquid through which the gas will be compelled to pass.

An elevation of the apparatus is shown; also a vertical section through one of the superposed chambers, and a plan view.

Each of the chambers B is furnished with a number (in this case five) of spraying devices, one of which, E, is keyed upon a central driving shaft F, while the others, G, are mounted upon shafts H arranged around the central shaft in a concentric circle. All the shafts are rotated in the same direction from the driving shaft I through the medium of bevel gear and toothed gearing.

The spraying devices G are as described in the 1908 patent; while the central sprayer E is in the form of an inverted cone keyed upon the



Kirkham, Hulett, and Chandler's Gas Cleaning Apparatus.

shaft F, and the rotation of which causes the liquid in the bottom of the chamber to be raised by centrifugal action and sprayed through perforations L in the upper part of the conical wall of the sprayer.

Immediately above the coned sprayer E is a circular perforated plate M, which revolves with it and the shaft F, and which is designed to catch the liquid falling from the chamber above and also to act as a sprayer.

Each spraying device has arranged beneath it an opening O in the division plate P between the superposed chambers; and each opening has an upwardly projecting wall or lip through which the gas passes upwards, the liquid overflows, and the shafts to which the spraying devices are attached extend. In addition to these openings, there are a number of others, G, preferably of curved or segmental shape, having upwardly projecting lips so as to retain the requisite quantity of liquid in each chamber. Above these openings there are arranged hoods R with serrated lower edges which dip into the liquid. The openings Q also serve to afford additional area through which the gas can flow.

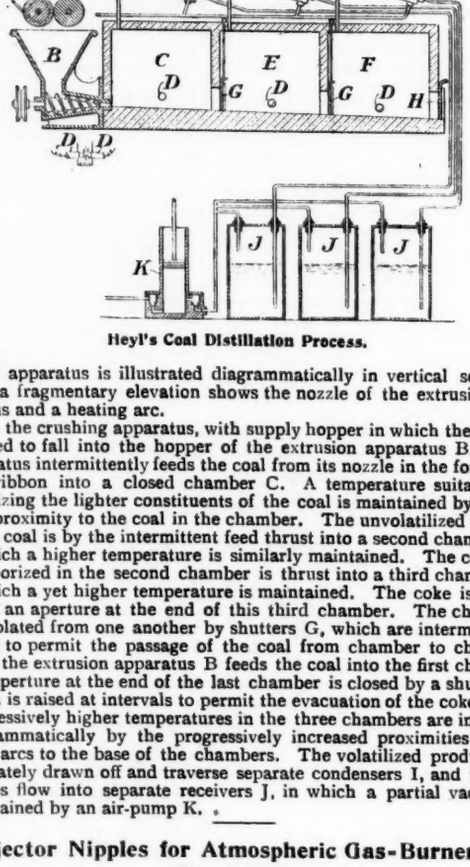
Distilling Coal.—No. 104,066.

Heyl, G. E., of Kingsway, W.C.

No. 5134; April 7, 1916.

This invention relates to a process and apparatus for distilling coal, of the kind in which the material in a state of subdivision is fed by extrusion apparatus, continuously or intermittently, in the condition of a rod into and through a chamber, or series of chambers, maintained at a temperature at which some or all of the contained oils become vaporized—the chamber being provided with means for withdrawing the vapours at the stages where generated.

The rod of coal is in a form presenting a large surface with a small mass, and is subjected in the chambers to the direct action of an electric heater—an electric arc or resistance. One heated chamber only may be employed, maintained at a temperature at which all the desired volatile products of the coal become vaporized—fractional distillation of the condensed vapour being effected in another apparatus. Alternatively, the coal may be subjected to fractional distillation in the one apparatus by causing the ribbon of coal to traverse successive chambers isolated from one another and maintained at progressively higher temperatures. The distillation may be carried as far as desired—either to obtain as a final product low-temperature coke containing some volatile constituents or high-temperature coke having no volatile content.



Heyl's Coal Distillation Process.

The apparatus is illustrated diagrammatically in vertical section; while a fragmentary elevation shows the nozzle of the extrusion apparatus and a heating arc.

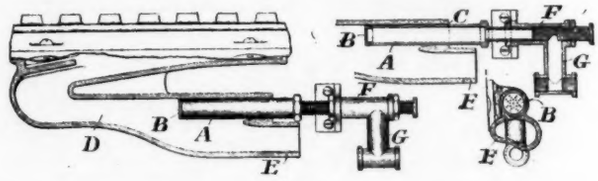
A is the crushing apparatus, with supply hopper in which the coal is crushed to fall into the hopper of the extrusion apparatus B. This apparatus intermittently feeds the coal from its nozzle in the form of a thin ribbon into a closed chamber C. A temperature suitable for vaporizing the lighter constituents of the coal is maintained by an arc D in proximity to the coal in the chamber. The unvolatilized portion of the coal is by the intermittent feed thrust into a second chamber E, in which a higher temperature is similarly maintained. The coal still unvaporized in the second chamber is thrust into a third chamber F, in which a yet higher temperature is maintained. The coke is thrust out of an aperture at the end of this third chamber. The chambers are isolated from one another by shutters G, which are intermittently raised to permit the passage of the coal from chamber to chamber, while the extrusion apparatus B feeds the coal into the first chamber. The aperture at the end of the last chamber is closed by a shutter H, which is raised at intervals to permit the evacuation of the coke. The progressively higher temperatures in the three chambers are indicated diagrammatically by the progressively increased proximities of the three arcs to the base of the chambers. The volatilized products are separately drawn off and traverse separate condensers I, and the distillates flow into separate receivers J, in which a partial vacuum is maintained by an air-pump K.

Injector Nipples for Atmospheric Gas-Burners.—No. 104,428.

Cannon Iron Foundries, Ltd., of Deepfields, and Hawthorne, H. S., of Cosely, near Bilston.

No. 7628; Nov. 23, 1916.

This invention relates to burners for use in connection with gas-fires, in which the jet is so made as to extend more or less into the interior of the mixing chamber of the burner, and thus provide means for regulating the nature of the flame according to the mixture or pressure of the gas.



Cannon Foundries and Hawthorne's Atmospheric Burner.

The gas-jet consists of a sleeve A fitted with a perforated nipple B and adjustably passing through an opening C into the interior of the mixing chamber D of the burner. Air is admitted through a branch E opening laterally into the mixing chamber—the injector being arranged to extend into the mixing chamber in advance of the rear edge of the air inlet aperture. The rear end of the sleeve is screwed into a fixed hollow socket F, through which the gas is supplied by one or other of the branches of the T-piece G. A collar on the sleeve admits of the rotation of the latter, and a lock-nut on the shank fixes the injector in any adjusted position. In this way, the character of the flame is regulated without altering the consumption of gas, and without the employment of a mechanical device for controlling the admission of air.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for March 28.]

Nos. 3925—4298.

Aldridge, J. G. W. and Aldridge & Ranken. "Screening coal, coke, &c." No. 4064.
Brown, J. H.—"Gas-fired coke ovens and furnaces." No. 4255.
Clare, T. A.—See Aldridge. No. 4064.
Grossmann, J.—"Utilization of nitre cake." No. 3933.
Johnston, J.—"Rotary compressors or exhausters." No. 4289.
Ranken, A. W.—See Aldridge. No. 4064.
Reilly, P. C.—"Distilling coal tar, &c." No. 3948.
Ritte, A.—"Gas-producers." No. 4124.
Sahlin, A.—"Gas-producers." No. 3988.
Simon-Carves, Ltd.—See Brown. No. 4255.
Soc. Française de Matériel Agricole et Industriel.—See Ritte. No. 4124.
Täggli, H.—"Bunsen burner." No. 4061.
Taylor, R.—"Safety gas or fluid cock." No. 3952.
Thompson, W. P.—See Reilly. No. 3948.
Tilley, F. C.—"Vapour burners." No. 4240.
Walker, O.—See Täggli. No. 4061.
Wilson, W. A.—"Gas-burners." No. 4096.
Wollaston, T. R.—"Gas generators and producers." Nos. 3962, 3963, 3964.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Committees on Private Bills.

The date of meeting of the two Select Committees of the House of Lords appointed to consider Private Bills, which was announced last week as 11 o'clock on the first sitting day after the Easter Recess, has since been altered.

The Committee who will have before them the Haslemere and District Gas Bill and the Hemel Hempsted Gas Bill, will meet on Wednesday, the 18th inst.

The Committee who are to consider the Kenilworth Gas Bill and the Lea Bridge District Gas Bill, will meet on Tuesday, the 24th inst.

On the latter Committee, Lord De Mauley takes the place of Lord Ponsonby.

SOUTH STAFFORDSHIRE MOND GAS (POWER AND HEATING) BILL.

The Unopposed Bills Committee of the House of Lords last Tuesday sent this Bill forward for third reading.

The Bill confers powers on the South Staffordshire Mond Gas (Power and Heating) Company to raise additional capital to the extent of £205,000, either by borrowing or by the issue of debenture stock or partly by either. The Company may also charge up to 5½d. per 1000 c.ft. if the total quantity taken by the consumer is not less than 4,000,000 c.ft. per quarter, or 6½d. per 1000 c.ft. if the quantity be less than this amount. The Board of Trade, however, have power to vary these charges if in any year it is shown that the cost of production is less than the cost of production in January, 1917. The Company are prevented from showing undue preference, and any consumer is entitled to a supply on similar terms in similar circumstances. The revision of charges may take place on the application of twenty consumers after January, 1922; and subsequently the Board of Trade may themselves revise the charges every five years. The new capital is required for the

purpose of extending the works to meet urgent national requirements. The present prices under the Company's Acts are 3d. and 4d. per 1000 c.ft. in respect of the quantities mentioned above, with a sliding-scale according to the price of good quality slack—the basis price being 6s. per ton. Doubts have arisen, however, as to whether the Board of Trade may have regard to anything else than the gross cost of fuel. It is further pointed out that the present charges only cover cost of production, owing to increases in other things than fuel; hence the impossibility of paying dividends on the preference or ordinary shares.

HOUSE OF COMMONS.

State Control of Coal Mines.

Mr. Duncan Millar again asked the President of the Board of Trade for information as to the policy of the Coal Controller in regard to the State regulation of mines.

Mr. Roberts said the Coal Controller was in very close grips with an extraordinarily complex problem. He had traced all the consignments of coal in the country from the pit to the consumer, with a view to ascertaining how far the coal had to be transported. The Controller regarded the possession of the statistics so obtained as absolutely essential to carrying out the scheme of organization which he had in contemplation. It was intended to co-ordinate the functions exercised by the Home Office and those with which the Coal Controller had been invested. Some 25 p.ct. of the working miners had enlisted, which had inevitably resulted in a diminution of output. It was impossible to obtain substituted labour as efficient as that which had been taken into the Army; but the Coal Controller was in communication on the matter with the Director-General of National Service. He was fully alive to the necessity of keeping up the output. In regard to absenteeism at the mines, the Controller wished him to say there were signs of distinct improvement, which was in large measure due to the efforts of the leaders of the miners' organizations. The Controller recognized that there were possibilities of economy in the internal organization of mines. He was shaping his plans with a view to what might occur in the winter of 1917-18. A memorandum dealing with the financial arrangements between the Government and the colliery owners had been agreed upon; but he could not give full information as to it. With respect to wages, it was not proposed to change them, or the system under which they were paid. The Controller would interfere as little as possible with the active management of, or the labour conditions in, the mines.

Committee on Private Bills.

A Select Committee of the House of Commons, consisting of Mr. Mooney (Chairman), Sir J. Hastings Duncan, Mr. Bird, and Lieut.-General Sir A. Hunter-Weston, will meet at 11.30 on Tuesday, the 24th inst., to consider a group of Bills, which includes the Sheffield Gas Company's Bill.

Exports of Sulphate of Ammonia.

Sir J. Harmood-Banner asked the President of the Board of Trade why the British Government allow exports of sulphate of ammonia to Java, Spain, and the United States to a large extent, and reduce the exports to West India and other British Possessions to the smallest possible limits, to the injury of next season's crops.

Captain Viscount Wolmer, on behalf of War Trade Department, replied that it was decided in December last that the issue of licences for the export of sulphate of ammonia should be suspended, in order to retain sufficient supplies in this country to meet the demand for agricultural purposes. Any recent exports to the countries named could only have taken place under licences authorized before the date of this decision. The needs of the West Indies were fully recognized; but it was to be regretted that the available supply is insufficient at the present time to allow of export.

Hours of Work in Coal Mines.

Major H. Terrell asked the President of the Board of Trade whether the provisions of the Coal Mines Regulation Act, 1908, limiting the hours of work in a coal mine to eight hours per day from bank to bank, were still in force, and what was the average number of hours worked by colliers per week in the South Wales coalfields.

Mr. Roberts answered that the provisions referred to were still in force. As regarded the latter part of the question, the only figures available were those giving the average number of days worked in the week. For South Wales and Monmouthshire, this number was 5·58 in February.

Good Working at Yorktown.—The Yorktown and Blackwater Gas Company have installed a steam-heated benzol extracting plant, which Mr. H. J. Randall (the Engineer and Manager) states is working satisfactorily. Reference was made to this matter at the annual meeting of the Company, whose report was alluded to on p. 621 of last week's "Journal." The Chairman (Mr. D. Sparvell) also pointed to the fact that they had been able to sell gas during the year at 3s. 4d. per 1000 c.ft., which, he thought, was one of the lowest, if not the lowest, of any company in the district. Mr. R. W. Edwards, of Aldershot, also commented on the excellence of the results obtained, and said they must congratulate Mr. Randall on the working.

Charge of Attempted Murder by Gas.—A Dutchman named Varenhorst was remanded at Marlborough Street Police Court last week, on a charge of attempting to murder Meyer and Wilhelmina De Leeuw by poisoning them with gas, and further with being found in the United Kingdom in contravention of an expulsion order. Inspector Mansfield said that he went to Warren Street and found a back room on the ground floor had been forced. Immediately behind the door he discovered that the fittings of the meter had been disconnected, and that a hole had been made in a door leading to the adjoining room. In this room, although the windows were open, there was a strong smell of gas. He arrested the prisoner in the basement of another house in Warren Street. A piece of gas-tubing was found in his possession.

MISCELLANEOUS NEWS.

BRITISH GAS LIGHT COMPANY, LTD.

The Ordinary Half-Yearly Meeting of the Company was held last Wednesday, at the London Offices, No. 11, George Yard, Lombard Street, E.C.—Mr. Robert S. Gardiner in the chair.

The Secretary (Mr. A. W. Brookes) read the notice convening the meeting, the report of the Directors, and the Auditors' reports. The Directors' report was as follows:

The Directors submit the half-yearly accounts of the Company to Dec. 31 last, as examined and certified by the Auditors, who have also vouched for the correctness of the investments held by the Company.

The available profit is £24,858, after deducting the following sums: Income-tax, £7546; interest on debentures, £5015; and interest on debenture stock, £2400—total £14,961 10s. 6d.

Hull.—The gas-rental shows an increase of £3440, as compared with the corresponding period of 1915, the price of gas being 2s. 4d. per 1000 c.ft., as against 2s. 1d. The gas sold shows a decrease of 32,366,337 c.ft.; being at the rate of 4·90 p.ct. The profit amounts to £970 in excess of the parliamentary interest.

Norwich.—The gas-rental shows an increase of £1679, compared with the corresponding half year of 1915; the price of gas having been the same in each period—viz., 3s. per 1000 c.ft., subject to reductions for gas used for manufacturing and other purposes. The gas sold shows an increase of 13,155,900 c.ft.—equal to 4·58 p.ct. The profit is £741 less than the parliamentary interest.

Potteries.—The gas-rental shows a decrease of £2029, as compared with the corresponding period of 1915; the price of gas being the same—viz., 3s. per 1000 c.ft., with a rebate of 3d. for prompt payment. Special discounts to large consumers and to consumers of gas for power purposes are also allowed. The gas sold shows a decrease of 22,651,229 c.ft., or at the rate of 12·05 p.ct. The profit realized is £2862 less than the parliamentary interest.

Trowbridge.—The gas-rental shows a decrease of £831, as compared with that of the corresponding period of 1915; the price of gas being the same—viz., 3s. 5d. per 1000 c.ft., with discounts according to consumption. The gas sold shows a decrease of 5,440,591 c.ft., or at the rate of 13·50 p.ct. The profit realized is £209 less than the parliamentary interest.

Holywell.—The gas-rental shows a decrease of £311; the prices of gas being the same—viz., from 4s. 8d. to 3s. 1d. per 1000 c.ft., according to the consumption and the purpose for which the gas is used. The profit realized is £141.

Total Profit and Dividend.—The total profit, added to the previous balance of profit and loss, amounts to £94,727. From this sum the Directors have transferred £5109 to the reserve fund. They now recommend a dividend at the rate of 10 p.ct. per annum, with a bonus of 2s. 6d. per share, both less income-tax. The dividend and bonus will amount to £24,046 leaving a balance to the credit of profit and loss account of £65,571.

A Sound Financial Position.

The Chairman, in moving the adoption of the report and accounts, said he thought he could look forward with confidence to a favourable reception of the resolution by the shareholders, because, considering the exceptionally difficult circumstances with which the working of the half year had been surrounded, he believed the accounts would commend themselves. He was happy to see present several representatives of the gas industry who were able to appreciate the unprecedented difficulties that gas undertakings had to contend with in these times. The profit for the half year was £39,820, as compared with £36,645 in the corresponding half of 1915. This therefore allowed the payment of the usual dividend and of the bonus, which had been reduced since the war, but was the same as last time, and left a small surplus of £800 to be added to the balance of undivided profit. The report mentioned that the Directors had added £5109 to the reserve fund. He might remind the shareholders that, at the last meeting, they approved the action of the Board in, for the first time in the history of the Company, establishing a reserve fund for the parent Company—a reserve fund created in accordance with the Articles of Association, which distinctly provided for one, specified the purposes to which it should be applied, and limited it to £100,000. When establishing the fund six months ago, they commenced with the appropriation of £20,500 from the balance of undivided profits. The Board had added a further £5109; and the fund, after allowing for depreciation of the investment, now amounted to £25,000. He thought it would be gratifying to the shareholders to know that the Directors had taken up this amount of new War Loan. The undivided balance at June 30 last was £69,869. At the close of the half year it amounted to £65,571—that was, after the appropriation of the £5109. He thought that this showed that the Company was in a very sound and healthy position. To have created in war time a reserve fund represented by £25,000 of War Loan, and to have undivided profits of £65,571, he thought that the shareholders would agree, testified to the soundness of the management in the past years, to which these results were chiefly attributable.

Points from the Stations—Unaccounted-for Gas and Charitable Donations.

Notwithstanding the low prices charged for gas, there was a decrease in the sale of gas in all the towns, except Norwich, varying from 5 p.ct. at Hull to 18 p.ct. at Holywell. After allowing for an increase of nearly 5 p.ct. at Norwich, there was a net total decrease of 4 p.ct. The decrease in the corresponding half year of 1915 was 6¾ p.ct., and in the corresponding half of 1914 it was 1½ p.ct., or a total decrease of nearly 11¼ p.ct. since the outbreak of the war. There was no addition to capital during the half year, as the small sum expended on services and meters was less than the amount written-off for depreciation. The capital per million cubic feet of gas sold now stood at £611, which was higher than the Directors liked, and higher than usual. But it was accounted for partly by the decreased sale of gas and by the fact of their having expended a large sum on new plant at Hull just before the war, from which they had not yet been able to derive any benefit, owing to the decrease in the sale of gas at this station. At Hull, for the first time for

several half years, the profit had covered the parliamentary interest; but there were arrears of interest amounting to nearly £7000 due to the Company by this station. The Company's application to the Board of Trade to substitute a calorific standard for the illuminating power one was still under consideration. The amount of unaccounted-for gas for the year at Hull was 5·12 p.ct. He was going to give the shareholders the amount of unaccounted-for gas at each of the stations, because he thought in these times, when it was so difficult to provide labour for searching for and remedying leakages, it was very creditable to the Engineers to have been able to keep the unaccounted-for gas down to low figures. At Hull, the Board, yielding to a strong local request, contributed £100 to a V.A.D. hospital, for which there was urgent need at the station. He hoped this donation would meet with the approval of the shareholders. The position with regard to charitable donations was not satisfactory. It was held that, under the Memorandum and Articles of Association, the Directors had no power to spend shareholders' money, even on such praiseworthy and desirable objects as hospitals and such like institutions. It was also a question whether they were able legally to grant allowances to workmen, or gratuities to dependants. Another company with which he was connected solved the difficulty by holding an extraordinary meeting, at which an additional clause was inserted in the memorandum, empowering the Company to support charitable institutions and give donations to their workmen. On applying to the Courts, this was at once sanctioned. The Board would consider whether it was necessary they should go to this trouble and expense in these times. He noticed that two or three other companies had done it in another way. The directors had asked the shareholders each half year or year to pass a resolution authorizing them to expend a sum not exceeding a specified amount on war charities. He left the suggestion with the shareholders. In their case, they were fortunate in possessing a member of the Bar on the Board (Mr. Abbey-Williams); and they were under his shelter. But he hoped that, in any case, the Board might take it that the contribution of £100 to the V.A.D. hospital at Hull met with the entire approval of the shareholders. [Hear, hear.] At Norwich, the profits fell short by £741 of the interest they were entitled to. This had to be added to the already large amount which this station owed to the Company. So far, since the outbreak of the war, the price of gas at Norwich had only had one small advance of 2d. per 1000 c.ft.; and he feared a further increase was inevitable. As to the unaccounted-for gas at Norwich, the figure for the year (in each case he was quoting the percentage for the year, which was a better criterion than for the half year) was 4 p.ct. At the Potteries, the profits had failed to meet the interest to which the Company were entitled by no less a sum than £2862. The unaccounted-for gas at that station amounted to 9 p.ct. He did not know whether any of the shareholders were acquainted with the district; but the old colliery workings there caused many subsidences, and the number of breakages of mains was exceptionally large. In the circumstances, he thought 9 p.ct. was very creditable to the Engineer. As to Trowbridge, there was nothing upon which to comment. At Holywell, the profit was only £141 on a capital of £16,553; so that the shareholders would not be surprised that the Directors had given notice of an increase in the price of gas from 4s. 8d. to 5s. In more normal and prosperous times, he intended to ask his colleagues to consider the propriety of writing down this capital.

COAL SUPPLIES.

The Board had had their anxieties during the half year. They had been considerable. As with other companies, the coal supply had been a source of great anxiety to the Directors, to the Engineers, and to the Secretary. He could not speak too highly of the daily watchfulness of the Secretary over the coal supplies and stocks. It was only by this care and watchfulness, and by the pressure he brought to bear on the coal contractors, that they had been able to keep up—not he was sorry to say their customary stocks of coal, but still except in one instance they had never at any station had less than five weeks' stock in store. The Directors had now been considering, for some time, the question of the renewal of their coal contracts. It had been the practice of the Company to purchase its coal for a long time in advance; and he thought this was a wise and sound policy, especially because it enabled them to form some idea of what would be the cost of one of the chief items of gas making.

A UNION APPLICATION FOR INCREASED WAGES.

He was sorry to say they had been faced with great anxiety in regard to wages and the conditions of employment of their workmen. He might say at once that the Company had always treated their officials and workmen with consideration and kindness. No workman, and indeed no widow or dependant of a workman, who had served the Company long and faithfully was ever allowed to be in want. They had at the moment on their books seventy pensioners. About two-thirds of them were officials or workmen and one-third widows. One of his predecessors in the chair—Mr. Horsley Palmer—instituted some few years ago a system of giving silver medals and a gratuity to the workmen who had been in their service for twenty-five years. It might interest the shareholders to know that there were no less than 240 such medallists in their employ. Then the salaried staff and the workmen had together received war bonuses during the half year amounting to no less than £4042, so that they could not be accused of want of sympathy with their workmen. The Board appreciated that, owing to the great advance in the cost of the necessaries of life and other circumstances, their employees deserved consideration; and soon after the beginning of the war, of their own accord, the Board began giving a weekly war bonus as an addition to the wages, which they had since increased on two or three occasions. They hoped the friendly feeling they entertained for their workmen was reciprocated. The Board were not aware that it was not. But the National Union of General Workers, writing to the Company from Birmingham, had signified that various advances in wages were demanded. In one case they applied direct to the Board of Trade, who suggested to the Company that the matter should be referred to arbitration, which they most willingly agreed to, because the arbitration would be conducted locally. The more the conditions of employment and the rate of wages paid by the Company were inquired into by those having knowledge of the local circumstances, the better for the Company, because he was sure they would come most creditably out of any investigation. These were anxieties that dealt with a period later than that comprised in the report; but he thought he ought to tell the shareholders that at the moment the Board had these very serious questions to consider.

STUDYING THE CONSUMERS.

The Company had done their duty, and perhaps more than their duty, to the consumers during the war. At Hull they deferred increasing the price of gas until the whole of the reserve fund at this station had been expended—that was to say, nearly £50,000; and, as already mentioned, £7000 was still owing to the Company by the station. This showed with what reluctance the Directors had advanced the price of gas. At Norwich, the advance of 2d. per 1000 c.ft. was only equivalent to 6 p.ct. He knew of no other commodity in the kingdom that had appreciated so little in price.

FIFTY-FIVE PER CENT. OF LADY SHAREHOLDERS.

In conclusion, he wanted to assure the shareholders that, while the Directors gave every consideration to the consumers and the workmen, they did not by any means disregard the shareholders. The Company were in a very peculiar position. An examination of the books recently disclosed the fact that 55 per cent. of the shareholders were ladies. He knew of no other company—gas or otherwise—in which it happened that the bulk of the shares were held by ladies. And it must be remembered that ladies were often totally dependent on the income derived from their investments. It had also to be borne in mind how fortunate they were in the issue of debentures, many of which were taken up by lady shareholders. They had a large amount taken up at 3 p.ct., and a still larger amount at 3½ p.ct. It was owing to the fact that so much of the capital was raised at a low rate of interest, and that for many years any improvement, alteration, or remodelling of the works that could be legitimately charged to revenue over a period of years was so treated, that the position of the Company was as strong as it was now. Therefore he wished, with a full sense of responsibility as to what he was saying, to assure the shareholders, both present and those to whom these remarks would be communicated, that the Board fully realized the considerable decrease in the net return they had derived from their investments during the last few years. At one time, the dividend was paid free of income-tax. Then afterwards there was a bonus of 5s. Now the income-tax was deducted both from the dividend and the reduced bonus of 2s. 6d. He wished to say that while the shareholders must not expect the Directors would be able to increase the present distribution, they might rely upon their doing their utmost to maintain it at the same rate.

Mr. Frederick Wilkin seconded the motion.

Mr. A. B. Bosher said he held stocks and shares in a very large number of gas companies; but he could assure those present that there was not one in which he possessed shares that he felt was better worked and better managed and administered than the British Gas Light Company. Considering the great difficulties with which the Board, their exceedingly good Engineers, and the staff at the various works had had to contend, he thought the way they had come out of the half year reflected the greatest credit upon them. The sympathy of the shareholders ought to go out to the engineers and managers, as well as their congratulations upon the very efficient way in which they had been able to carry on the business. Personally, he did not think that in the end things would "pan out" at all badly for gas companies. He fully believed there was a sense of justice in the governing bodies of this country that would not allow gas companies to be penalized to an extent they did not deserve. While complimenting the Directors upon the half-yearly report, he also congratulated the Chairman upon the convincing speech he had made.

Mr. Pullman remarked that the balance-sheet disarmed all criticism. But there was one question he should like to ask, and that was as to the assistance given to war charities and to the members of their staff of workers who were risking their lives in the defence of the country. Every encouragement ought to be given in this direction; and he asked if it would strengthen the hands of the Board if the shareholders passed a resolution authorizing subscriptions to an amount that they might suggest.

Mr. C. Webb asked whether there was any special reason for the receipts from Hull showing such a large increase as £10,000, and was the increase likely to continue at that rate.

The Chairman, in reply, expressed his thanks and those of his colleagues for the kind remarks by Mr. Bosher. He understood that that gentleman was practically acquainted with the difficulties with which gas companies were faced at present; and therefore his very gratifying remarks on the management of the Company were much appreciated by them all. The position of the Company was intrinsically sound; but he confessed that, after all that had been done for their workmen—well and ill—and for their dependants, he acutely felt the action of the men in not coming straight to the Directors and telling them what grades were dissatisfied with their pay, or what further pay they required, without thinking it necessary to go to an organization in Birmingham to communicate with the Board with regard to their terms of employment. In reference to the suggestion of Mr. Pullman, he (the Chairman) thought, respecting the allowances to their workmen, they must take the stand that these were within their powers. He could not believe that the question of dealing with their workmen or of giving allowances to their widows, even if the Articles of Association did not distinctly say so, was outside their rights and authority. Respecting subscriptions for charitable purposes, he thought (though he had not had an opportunity of consulting his colleagues) that if the shareholders would pass a resolution to the effect that the Directors be authorized to expend a sum not exceeding 200 guineas on war charities during the current half year, it would at all events show the approval of the shareholders, and be a guidance to the Directors. As to the increased profit at Hull, this was principally due to the fact that they had during the half year felt the full effect of the advance in the price of gas there from 2s. 1d. to 2s. 4d. per 1000 c.ft. As to whether this additional profit was likely to continue, he sincerely hoped it would.

Mr. Bosher inquired whether in the matter of price the Company worked uniformly with the East Hull Company.

The Chairman said the price of the Company's gas used to be some 4d. or 5d. cheaper than in East Hull; but the present price of 2s. 4d. was only 2d, less.

The motion was unanimously carried.

The Dividend and Bonus.

Proposed by the Chairman, and seconded by Major-General W. T. Corrie, a dividend at the rate of 20s. per share and a bonus of 2s. 6d., both less income-tax, were declared.

Contributions for Charitable Purposes.

On the motion of Mr. Pullman, seconded by Mr. Kenneth R. Mackay, a resolution was passed empowering the Directors to expend a sum not exceeding 200 guineas in war charities during the current half year.

Votes of Thanks.

Mr. Pullman said the shareholders ought not to separate without passing a cordial vote of thanks to the Chairman and Directors for their able conduct of the business of the Company during the half year. Practically no questions had been asked on the balance-sheet, which pointed to the fact that everybody was completely satisfied. It must have been as gratifying for the Directors to present the accounts as it was for the shareholders to receive them. Although another resolution would be proposed, he should like to associate himself with the appreciation that had been expressed of the services of the engineers and staffs, especially of their able and competent Secretary.

Mr. Bosher seconded the motion, which was heartily passed.

The Chairman, in responding, said his colleagues and himself were much obliged to the shareholders for the vote of thanks. He had been a Director of the Company for a great many years; and he did not remember any occasion on which the shareholders had expressed themselves in more appreciative terms than that day of the efforts of the Directors. These remarks were very welcome to the Board; and, if he might venture to say so, as it was only his second appearance in the chair, he himself appreciated them very warmly. He wished to mention that Lieut. Palmer (the son of one of his predecessors in the chair), who was a Director, was wounded at the front. He had now recovered, and was on home service, but could not get leave to attend the meeting that day. It was now his pleasant duty to move a vote of thanks to the Secretary, the Engineers and Managers, and all their officers at the stations for their indefatigable services. Many of their staff were absent on military duties; but all their officers to his own knowledge were giving an amount of time and care to their duties that deserved all the kind things that could be said about them. As to Mr. Brookes, their Secretary, he (the Chairman) could not say how safe he always felt with him, knowing well that he did not overlook anything. He was in constant communication with all their different stations. They were the only English Company that supplied gas in five towns in five different counties. Therefore, the work of the Secretary and of the London office staff was of quite an exceptional and complicated character. Then in Mr. Young, Mr. Glover, Mr. Copp, and the other Managers, they were fortunate in possessing engineers of the highest capacity in the profession; and they did not spare themselves either day or night in these times to do their best in every respect. He did not want to bring a blush to the cheeks of Mr. Glover, whom he was glad to have present; but if the shareholders could see at Norwich their Engineer's fleet of motor lorries, large and small, they would the better appreciate how he had organized the entire system of distribution of coke in order to derive the best revenue possible from that product. Such work alone entitled Mr. Glover to the very hearty thanks of the shareholders.

Mr. Henry Woodall, in seconding, remarked that in Mr. Young, Mr. Glover, and Mr. Copp, who were the Engineers of their chief stations, they had the pick of the gas profession. The Chairman, in proposing the vote of thanks, did not include the workmen. They all knew there had been labour troubles; and they must remember, as he was sure they did remember, that a great many of the men were serving the country at the front, and that those left behind had, on the whole, done excellent service.

The resolution was cordially carried.

Mr. Brookes said he had much pleasure in acknowledging the vote on behalf of the officers. The difficulties of the Engineers had not diminished. On the contrary, owing to the long duration of the war, they were increasing and becoming more acute. He was sure all the Engineers were putting forward their best efforts to cope with the troubles; and it would be most gratifying to them, as it was to himself and his staff, to receive this recognition of their services. As Mr. Glover was present, he thought perhaps the shareholders would like him to reply.

Loyal Workmen.

Mr. Glover said he felt it was an honour to be present, and to hear the result of this very successful half-year's trading, in spite of all the difficulties they had had to encounter and overcome. Engineers, if they were of the right type, ought to smile at difficulties; and although they had not always been able to smile when the difficulties had been present, they had done what engineers ought to do to overcome them. He did not think they were yet at the end of their resources. These resources had been severely tested; but, thanks to the support of the Board in past years, and during last half year, they had been able to keep up a full supply of gas (which was their duty), and had come out in the end with flying colours. He had said "thanks to the support of the Board." If they did not have this support their difficulties would be overwhelming. During the half year, the difficulties had been great—there was no doubt about that—but the result had been as had been sketched. The support of the Board consisted in having provided good works under the advice of their Engineers. If they had not had good mechanical appliances they could not have done what they had done. But in addition to mechanical appliances, they needed loyal workmen. He believed, although a few had thought they could do better by going to the Union, the Company had still a large number of loyal men; and when this phase had passed, the Company would again realize the good conditions that had always in past years existed between the Directors and Engineers and the workmen. He thanked the Chairman, Directors, and shareholders for the hearty vote of thanks they had given to the Engineers, their staffs, and the workmen.

ALLIANCE AND DUBLIN CONSUMERS' GAS COMPANY.

The Half-Yearly Meeting of the Company was held at the Offices, D'Olier Street, Dublin, last Thursday—Mr. John Murphy (the Chairman) presiding.

The Chairman, in moving the adoption of the Directors' report and the statement of accounts, said he regretted the figures were not quite so good as those he had been able to submit on previous occasions; but he hoped when they had given the matter consideration, and realized the exceptional difficulties under which the working of the Company was carried on during the half year under review, they would consider them quite satisfactory. There had been a further reduction in the output of gas; and the cost of production had considerably increased. On the other hand, the prices obtained for residuals might be considered very good. The diminution in the output of gas was due to three causes. There was the operation of the Summer Time Act; and the destruction, during the rebellion last Easter, of an important business district in the city—which so far had not been reconstructed. While on this point, he should say the Company had received during the current half year substantial payments—amounting to £7522—on account of their claim for compensation; and there only remained one question to be cleared up, which was in connection with the explosion on the O'Connell Bridge. Then there was the reduction in the hours of public lighting. The hours in Dublin alone had been reduced from 1778 to 929 in the period under review, and the number of lamps from 4251 to 2769. The profit for the half year showed a decrease, as compared with the corresponding six months, of £11,045. The cost of coal and oil, including the rates of freight, had advanced considerably in comparison with a year ago; and it would be seen that, under this head alone, the expenditure was larger by no less a sum than £18,805. Against this, however, there was a satisfactory increase in receipts from coke and breeze of nearly £14,000, and also further increases in respect of tar and liquor of £2000 and £300 respectively. Purification had cost more by £429; but expenditure on repairs and maintenance of works was less by £1996.

The total expenditure on distribution, after deducting the sales of gas-fittings, amounted to £23,065, or an increase of £4089. The expenditure on repair, maintenance, and renewal of mains was heavy; and on this item alone there was an increase of nearly £4500. In view of the largely increased consumption in both the neighbourhoods of Drumcondra and Glasnevin, it was considered imperative, before the winter arrived, to renew the mains supplying these districts, substituting for the old ones pipes of increased capacity. The result, so far as the work had been completed, had been satisfactory. Miscellaneous and special charges showed an increase of £1236. This was accounted for, on the one hand, by a very large addition in the war bonus granted to employees—amounting, during the half year, to nearly £2000; while, on the other hand, bad debts were less by £700. On the credit side of the revenue account, the net receipts for gas for all purposes were less by £6000 as compared with the corresponding half year. The amount received for rental of prepayment meters and stoves showed an increase of £1700, which was very satisfactory, and a still further improvement in collecting. It was satisfactory to find that the stock of coal was larger than at the corresponding period by nearly 6000 tons.

The buildings and plant at the works had been maintained in a good state of repair and efficiency. Each year one section of the retort-settings was renewed; and the contract for this work had again been placed with Messrs. Drakes Limited, of Halifax. The conversion of one of the gasholder tanks, at the City works, into a tar and liquor tank, had been completed and brought into use—all the work in connection with the covering of the tank having been carried out by their own workmen. During the half year they had rebuilt, and put into operation, the retort-settings at the Bray works; and, although the reconstruction was on the simple direct-fired system, he was pleased to say that the results obtained were very satisfactory. There was a reserve fund, which was only applicable for the purpose of equalizing dividends; and, after giving the matter their best consideration, the Directors decided to declare the full statutory dividend, taking from reserve the sum of £10,497 to enable them to do so. They had so far been able to avoid increasing the price of gas; but they found it was no longer possible to do this, and that they must fall into line with practically all gas undertakings in the kingdom. They had, therefore, announced an increase of 6d. per 1000 c.ft.

The report was adopted, and a dividend of 5½ p.ct. per annum was declared on the consolidated ordinary stock.

The retiring Directors (Messrs. J. E. Fottrell and A. Bond) and the Auditor (Mr. William Cash) were re-elected; and the Chairman, the Directors, and the staff were thanked for their services.

The Secretary (Mr. W. J. Grey), returning thanks for the staff, mentioned that the war bonus had given great satisfaction.

Mr. William Newbigging (the Engineer) also thanked the meeting on behalf of himself and his department.

Municipal Coke Distribution.—The Controller of Coal Mines is communicating with the London local authorities stating that he desires to encourage the consumption in the district of coke produced at London gas-works, in substitution both for provincial coke and also for coal, with a view to economizing railway transport as much as possible and of conserving the national resources. He is inquiring what facilities the Councils have at riverside or canal wharves for (1) the unloading of coke from barges, (2) storage of coke, and (3) reloading into vans; whether the Councils would be prepared to co-operate with the London gas companies for the entire handling of the coke; and in what other directions the Councils could assist in its disposal.

FLETCHER, RUSSELL, & CO., LTD.

The Twenty-fifth Annual Meeting of the Company was held at Warrington last Thursday—Mr. Thos. W. Fletcher (the Chairman) presiding.

The Chairman, in moving the adoption of the report and accounts, said he thought the shareholders would agree that the firm had done exceedingly well with the depleted staffs and other disabilities. In the opinion of the Directors the balance-sheet was a thoroughly sound one. The works had been maintained in good order during the year. Although a larger business had been done than in the previous year, there had been a decrease in the ordinary trade of the Company, which was fully expected. This decrease had, however, been more than made up by war work. Before arriving at the profit shown in the accounts, large depreciations had been allowed for, especially in the pattern value. In the profit and loss account, the balance, after charging depreciations from trading account, interest on investments, cottage rents, and transfer fees, amounted to £20,906. Deducting the debenture interest paid to the end of the year (£2639) and the fees of the Directors and Trustees (£496), which made a total of £3135, there was left a balance of £17,770. Adding to this the amount brought forward from last year, £5928, made up a total of £23,699. Deducting the interim dividend on the preference shares at 6 p.ct. per annum for the half year ended June 30, 1916 (£1500), there was a balance left of £22,199. The Directors recommended that a final dividend be paid on the preference shares for the six months ended Dec. 31, which would absorb £1500; a dividend of 5 p.ct. on the ordinary shares for the past year, which would absorb £5000; a bonus of 5 p.ct. for the year on the ordinary shares, absorbing £5000; further, that the sum of £4885 be transferred to the reserve fund, and that the balance, £5814, be carried forward to next year's account. According to the Articles of Association, it was necessary to transfer to the reserve fund 50 p.ct. of any surplus profits which were available for a further dividend after payment of the preference dividend and 5 p.ct. on the ordinary shares. By the transfer to the reserve of £4885, this fund now stood at £29,201. The Company's trade with the Colonies had been much hampered owing to the Government restrictions on the purchase of materials for the export trade. As regards the Continental trade, the shareholders would understand that this had fallen off considerably owing to the crisis. They were practically the pioneers in gas apparatus work for munition works; and they were doing all they could to increase the output of munitions in these departments. Their thanks, and the thanks of the Government, were due to their staff of very loyal workmen.

The report was adopted; and the dividend and bonus recommended were declared.

COALITE LIMITED.

The Ordinary General Meeting of Coalite Limited was held last Wednesday, at the Liverpool Street Hotel—Mr. H. Willmott, the Chairman of the Company, presiding.

The Chairman, in moving the adoption of the report, said it was not to be expected that there could be any marked change in the finances of the Company until the works at Barnsley were in full operation, and proved the process to have the value which the Directors attached to it. The delay in the completion of the plant had been due chiefly to labour difficulties and war conditions; but they hoped to be very busy in dealing with their foreign patents as soon as the Barnsley plant was in operation. The world was the Company's field; and now that every civilized nation had become alive to the vital importance not only of conserving its coal energy, but of providing cheap power for every form of industrial enterprise, as well as to the enormous value attaching to the recovery of the many valuable bye-products from coal distillation, it was manifest that low temperature carbonization must progress by leaps and bounds. So many improvements had taken place, principally of an engineering character, in connection with the standardizing of the Barnsley plant, that they were quite satisfied that it would be a long time before any possible competitor could gain anything like the knowledge possessed by the management. He was entirely convinced that, had it not been for the enormous amount of money expended in the past, they would not have arrived at their present position. Some of the most important judges in the country who had visited Barnsley during the past few months were of one accord that the engineering in connection with the plant was quite unique, and the last word in carbonization. The Government were carefully watching the development; and a very important Committee had been appointed by the President of the Board of Trade to deal with the economical supply of electric power for all classes of consumers in the United Kingdom. The Directors were perfectly satisfied that the process owned by the Company would give the country cheap electric power, which was the greatest economical factor they would have to face from now onwards. In addition to this, there were all the many bye-products obtained from low-temperature distillation—such as motor spirit and the heavier oils—that the country was importing at the present time at enormous cost, besides which there were other valuable bye-products for which there was practically an unlimited demand. The British Coalite Company, with which they were closely allied, appeared to be on the eve of reaping some advantage from the seed it had so plentifully sown. That Company owned the British rights for the processes in respect of which the Coalite Company controlled the foreign patents; and arrangements were being made to grant a licence for the use of the process for the United Kingdom to a development company which was about to be formed with very powerful interests.

The report was adopted.

A War Savings Association has recently been formed at the Eastbourne Gas-Works; and at the present time there are upwards of eighty members, subscribing for over 160 certificates.

SOUTH SUBURBAN GAS COMPANY AND THE TRIBUNAL.

In the list of applications before the Lewisham Tribunal on Friday were claims for five employees of the South Suburban Gas Company. Previous references to the Company's staff and the Tribunal will be found on pp. 369 and 475 of the last volume of the "Journal."

The Military Representative (Mr. H. E. Harry) stated that, subject to the sanction of the Tribunal, he had come to an agreement with the Company's Engineer (Mr. S. Y. Shoubridge), who was not applying for any A or B1 men other than those before the Tribunal. The suggested arrangement was that a gas-fire tester, classed B1, should be granted three months, with leave to apply again; that the foreman of the meter department, B2, should be granted six months, on the same lines; that a gas-cooker repairer, B2, be granted six months; that a meter repairer, A (whose place it was difficult to fill), should have three months, final, the Company not to ask for leave to apply; and that a bricklayer, B1, should have three months, final.

The Tribunal ratified the agreement.

THE LIGHTING OF PERTH (W.A.).

In his review of the operations of the Perth (W.A.) Gas and Electricity Department for the year ended Oct. 31 last, Mr. C. E. Crocker (General Manager) states that the operation of the gas plant resulted in an output of 105,711,000 c.ft. of gas, or 15·5 p.ct. increase over that of the previous year. To manufacture the gas, 7876 tons of Newcastle coal and 13,863 gallons of oil were used. The average quantity of gas made per ton of coal carbonized was 12,928 c.ft., an improvement of 3·7 p.ct. over the preceding year. The maximum daily output reached 384,000 c.ft., as against 323,000 c.ft. the year before. During the year five miles of street-mains were laid, making the total 78,864 miles. The new holder at East Perth was completed, and has greatly assisted the overloaded plant. The heavy demand and the low pressure on some mains made it necessary to refuse further extensions, and in some places to refuse to connect new consumers. Until the new plant at East Perth can be proceeded with, it has been essential to make some additions to the old plant, to keep up the output; and two extra beds of retorts and a condenser are being installed. The latter will be removed later to the new plant at East Perth. It is not, however, possible to proceed with the construction of this plant at present. The material cannot be obtained; and, even if obtainable, the cost would be excessive.

It has been necessary during the year to meet continual increases in the cost of materials and supplies, and in wages; and there have been also further interest and sinking fund payments on the additional loan moneys expended. To meet these extra costs, economies have been effected wherever the opportunity has occurred; and thus it has been possible so far to avoid an increased charge for gas and electricity. The profit on the electric supply is £37,937, compared with £37,724 in 1915. For the gas supply, it is £14,208, compared with £14,163. The total of £52,146 shows an increase for the year of £257. After deducting interest (£22,660), sinking fund (£13,670), and balance of city lighting (£1434), the net balance is £14,380, which is added to the amount brought forward from the general profit and loss account last year, the whole of which is used in the business for working capital, &c.

Well-Paid Labour at Sydney.

In the early part of this year, there was trouble at the Mortlake works of the Australian Gas Light Company owing to the refusal of the coal lumpers to unload cargoes unless their claim for an extra man in each gang was conceded. Referring to the men's stoppage of work, which at one time threatened the gas supply of Sydney, the Minister of Labour and Industry made the following explanation: By an arrangement with the Gas Company, the men receive twenty hours' payment for the discharge of 1000 tons of coal. They can take their own time; but whatever the time is, twenty hours are paid for. They generally discharge the coal in eight hours, but always draw twenty hours' pay for 1000 tons. Under this system of payment, they average about £7 per week per man for thirty hours' actual work. In 1908 the labour cost of handling the coal was 11d. a ton; it now stands at 1s. 8d. per ton; so that during the war period the men have obtained material advances. After the coal miners' strike, however, the men suddenly announced that they would not work unless an extra man was put into each gang. On the matter being brought before Mr. Justice Edmunds, it was definitely stated that if the decision of the Court was against the men they would not work. Although inquiry by the Gas Industrial Board was pending, the men ceased work before the Board had made the necessary investigation. If the men who work under such good conditions can suddenly take action which may again deprive us of gas supplies, the community is at the mercy of highly organized unions. This is a case in which the law must be strictly enforced; and the necessary steps to this end are being taken immediately.

Huelva Gas and Electricity Company.—The report of the Directors for 1916 shows that the loss for the year amounts to £9040, to which has to be added the debit balance at the end of 1915 (£453), leaving £9493 at the debit of the profit and loss account, after providing for all known claims, and interest on the debenture stock to the date of balance. The loss is due to war conditions and the impossibility of obtaining coal at a cost delivered in Huelva at which gas and electricity could be manufactured at a profit. During the first week in January, the Association of Mineral Exporters in Huelva took over the working of the electricity department. The gas department is being carried on, and endeavours are being made to ensure that the prices received will enable the Company to pay for the requirements in gas making.

COAL AND COKE OUTPUT IN THE UNITED STATES.

According to Mr. C. E. Lesher, Coal Statistician of the United States Geological Survey, the quantity of bituminous coal mined in 1916 was more than 509,000,000 net tons—an increase, compared with the output in 1915, of more than 66,500,000 tons, or 15 p.ct., and compared with the previous maximum (in 1913) of 31,000,000 tons. The production of Pennsylvania anthracite was 88,312,000 net tons, or about 600,000 tons less than in 1915. The total output of coal in the United States is, says the "Gas Record," thus estimated at 597,500,000 net tons, and the final figures may show 600,000,000 tons.

The estimated output of coke in the United States in 1916 was 54,325,000 tons, an increase compared with 1915 of 12,744,000 tons, or 30 p.ct. The output of beehive coke was about 35,122,000 tons, an increase of 27 p.ct. compared with 1915; and the production of bye-product coke, 19,203,000 tons, or an increase of 36 p.ct.

It is estimated that last year 27,500,000 tons of coal were used in the manufacture of bye-product coke; that 270,000 net tons of sulphate of ammonia, 192,000,000 gallons of tar, and 35,600,000 gallons of light oils were recovered; and that the surplus gas amounted to 118,000,000,000 c.ft.

CAUSES AND PREVENTION OF CORROSION OF STEEL MAIN AND SERVICE PIPES.

The East Ohio Gas Company, supplying natural gas, having experienced much inconvenience and expense in continual replacement of pipe-lines, necessitated by corrosion, engaged two chemists—Messrs. K. Ennerling and C. Lindner—to investigate and report; and they have supplied to the "Natural Gas Journal" a note of the conclusions arrived at, which is important in view of the increasing use of steel for high-pressure pipe-lines.

The causes are segregation of impurities in the steel, air and water, harmful matters in the soil, and electric currents. Corrosion may be due to one or all of these things. Moisture is in all cases an essential, if only in small quantity; and one form is electric action, the current being generated by impurities in the metal that are electro-positive to certain constituents of the soil, and water containing soluble matters as an electrolyte—the current being so feeble that it cannot be detected by any known means. Or one part of the pipe may be electro-positive to another, and create galvanic action irrespective of the soil, in the presence of water. Air and water alone will cause corrosion under conditions such as warmth and a large amount of water in the soil and air. Iron passes into solution, is oxidized to insoluble ferric oxide, and replaced by more iron; and this may continue until the whole of the metal is oxidized. The presence of carbon dioxide will accelerate the oxidation, by forming a weak acid. With pure air and water, the action is slow; but water is always more or less impure, and the action is assisted. The harmful constituents in the soil are ferric oxide, sulphates of iron, calcium, and sodium salt, and organic acids formed by the decay of vegetable matter. Sulphides of iron and as well as calcium are present in cinder-fills, and are very injurious.

Evidently the chief factor in prevention is to keep water away from the metal; but most of the expedients suggested for this purpose—such as painting, enamelling, or dipping with or without wrapping—are too complex, too expensive, or not efficient. The most satisfactory results were obtained with steel dipped in tar and wrapped in muslin. The coating was heavier than paint, and more durable. The tar must be acid free, and the metal clean and perfectly coated. At the best, paint does not adhere firmly if the metal is not scrupulously clean; but by coating and wrapping the pipe when hot, and re-dipping a firmly adhering coating is secured, and if the consistency is such that the tar does not crack or get brittle in cold weather the covering cannot be excelled.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *April 2.*

In the London market pitch is increasingly firm, and it is reported that 31s. 6d. net per ton f.o.b. makers' works has been paid for export. There is a good inquiry for 95/160 solvent naphtha; but supplies appear to be nearly absorbed. Ordinary London creosote is also in demand for fuel purposes, and 4½d. net in bulk at maker's works is readily obtainable.

The make of sulphate of ammonia is being taken for home agricultural use on the basis of the official price, while the export of this product remains prohibited.

Tar Products in the Provinces.

April 2.

Markets for tar products are unchanged. In pitch, no business of importance is reported. Solvent and heavy naphthas are steady.

The average values of gas-works products during the week were: Gas-works coal tar, 20s. 3d. to 24s. 3d. Pitch, East Coast, 16s. 6d. to 17s. 6d. per ton; West Coast—Manchester 15s. 6d. to 16s., Liverpool 16s. 6d. to 17s., Clyde 17s. to 18s. Benzol, 90 p.ct., North, 10½d. to 11½d.; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal-tar crude naphtha, in bulk, North, 6¾d. to 6¼d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 2d. to 1s. 3d. Creosote, in bulk, North, 3¼d. to 3⅜d. Heavy oils, in bulk, North, 3⅜d. to 4d. Carbolic acid,

YOUR GAS.

THINK what a fighting force it has proved to Britain and her glorious Allies.

NO doubt you are anticipating further great demands with the moving months, for cooking by gas is patriotic as well as popular.

THEREFORE arrange for your supplies of "MAIN" Cookers now.

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WORKS: Gothic Works, EDMONTON, N.; Gothic Ironworks, FALKIRK; and Gothic Works, BIRMINGHAM.
SHOW-ROOMS AND BRANCHES: 25, Princes Street, Oxford Circus, W. 136, Renfield Street, GLASGOW; 83, Old Market Street, BRISTOL; 18, Severn Street, Deansgate, MANCHESTER; 97, Millfield, BELFAST; 333, Queen Street, MELBOURNE; and 12, Cunningham Lane, Pitt Street, SYDNEY, N.S.W.

60 p.ct., East and West Coasts, 3s. 4d. naked. Naphthalene salts, 80s., bags included. Anthracene, "A" quality, 3d. per unit; "B" quality, 1½d. to 2d.

Sulphate of Ammonia in the Provinces.

Liverpool, *March* 31.

The Government Department in control has continued to withhold licences, and actual values for exports are unquotable. The prices for home agriculture are unchanged at £16 per ton direct to farmers and £15 10s. to middlemen, net cash, in makers' bags, carriage paid to all destinations in the United Kingdom.

Nitrate of Soda.

There is no alteration in this market, holders still requiring 24s. per cwt. for ordinary quality, and 24s. 3d. per cwt. for refined, on spot.

COAL TRADE REPORT.

Northern Coal Trade.

The coal trade of the North is hampered by lack of steamers; but the output at the mines is a little heavier, as is customary before the holidays. The local demand seems full for the season. Best Northumbrian steams are 30s. per ton f.o.b.; for second-class steams, the quotations vary from about 21s. to 22s. 6d.; and steam smalls are easy and plentiful, at from 16s. to 19s. In the gas coal trade, there is a good home demand, and shipments to the South and to France are maintained fairly well; but to some of the neutral countries exports are limited. The prices for best Durham gas coals are from 24s. 6d. to 25s. 6d. per ton f.o b.; for second-class descriptions, 16s. 6d. to 18s. 6d.; for "Wear Specials," from about 29s. to 30s. Gas coals have to meet very high freights where chartering has not been arranged previously—about 20s. Tyne to London having been paid. Little is doing in new contracts for gas coal; but the desire seems to be for longer periods than the "three months" that has been hinted at officially. Gas coke is generally firm, as the production is rather less. The price for good quality is from 30s. 6d. to 32s. 6d. per ton f.o.b., according to the place of shipment. Coke freights are still on the basis of 45s. to Dunkirk or Boulogne, from the North-Eastern ports.

The "Elland Echo" of last Friday says: "This week another hospital has been opened, at the old Brooksbank School, which, after having been purchased by Dr. Hoyle, has now been equipped as a second war hospital. Dr. Hoyle has been backed up splendidly in this scheme by Mr. Robert Porter, Mr. Beaumont, and the Rev. G. E. Aspinall. In fact, it would not perhaps be far wrong to look upon the whole scheme of equipment and arrangement as a kind of unofficial Elland Gas Company undertaking. All honour to those who have been chiefly associated with such a beneficent movement."

Price of Gas Up at Thirsk.—The Directors of the Thirsk Gas Company have decided to increase the price of gas to 4s. 6d. per 1000 c.ft. to ordinary consumers. Through prepayment meters 17 c.ft. will be supplied for 1d. About two years ago, the price was increased from 3s. 10d. to 4s. 2d. per 1000 c.ft. for ordinary lighting purposes.

Sligo Gas Company.—Mr. Arthur Jackson, J.P., presided at the annual meeting of the Company. The report, adopted, stated that the year's working showed a profit of £370; and with the balance from the previous year there was (after providing for the preference interest), an available sum of £460. The dividend declared was at the rate of 4 per cent. per annum on the ordinary shares, less income-tax.

Meter Testing in Sydney.—A statement issued by the Minister for Labour and Industry in Sydney shows that during the year 1916 there were 38,119 gas-meters tested. Less than 2 p.ct. of new or repaired meters were found to be inaccurate or defective. But nearly 30 p.ct. of those submitted in the condition in which they were last used had to be rejected. Some had not been examined for twenty years or more.

Suggested Maximum Price for Coke.—Regarding the appeal of the Controller of Mines to secure municipal co-operation in the distribution of coke, the Deptford Council report that they foresee that if the consumption of coke is to be encouraged it will most likely have the effect of putting up the price. Already coke is very nearly the same price as coal, the maximum price for the sale of which has been fixed, and, in the interests of the community, it is desirable that there should also be a maximum price for coke.

Loan for Stoves and Meters Refused.—The Plymouth Corporation Gas Committee have been informed that their application to the Local Government Board for permission to borrow further money for stoves, meters, &c., for the Devonport gas undertaking has been refused. The Board state that Lord Rhondda has been in communication with the Treasury on the subject and was informed that, in the absence of evidence that the case was one of pressing necessity, either for reasons of public health or on account of war requirements, the Treasury did not see their way to approve of the raising of money to meet this expenditure at the present time.

Public Lighting at Crediton.—A controversy having arisen as to the amount to be paid for the lighting of the town, the Crediton Gas Company have informed the District Council that they had contemplated asking for an increased price owing to the advance in the cost of manufacture; but in order to meet the Council, they would make an allowance of 5 p.ct. off the account under the present contract if the Council would enter into a new contract for the public lighting in future. Some members of the Council contended that the proposed allowance was inadequate in view of the largely restricted lighting. The Chairman said no bill had been sent in; but they would have to pay the full amount under the contract if the Company pressed for it. The matter was referred to a Committee.

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IDEALLY PERFECT CONSUMPTION.
Full particulars of the many advantages of this Furnace on application.
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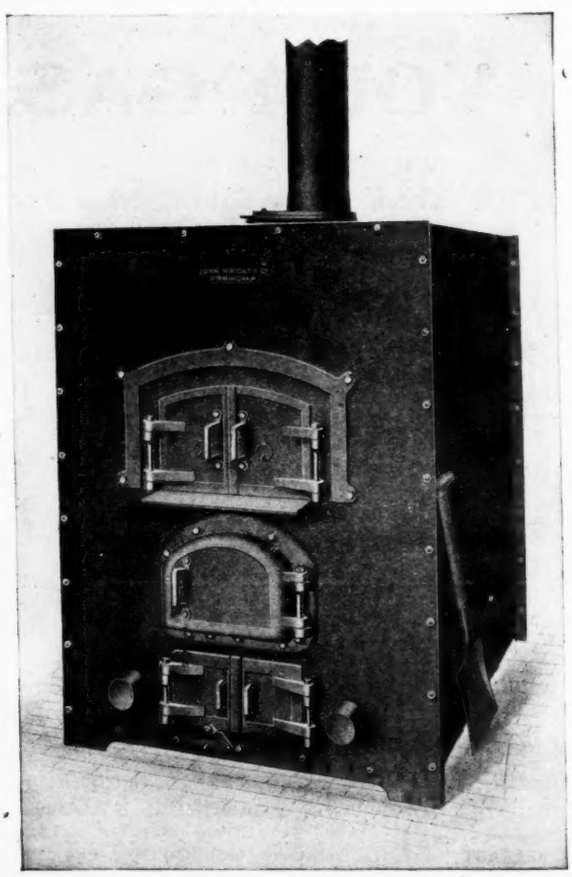

Price of Gas at Dudley.—At the next meeting of the Dudley Corporation Mr. Young will move—"That the Council protest against the proposal of the Gas Company to again increase the already high price of gas, and hereby resolve to take such action in preventing same as their powers permit."

Gas Company's Ground and Allotments.—The Allotments Sub-Committee submitted to the Eastbourne Town Council a report which included considerable correspondence between the Committee and the Gas Company concerning the cultivation of the Company's land. The Company declined at first to break-up their land for allotments; but in the report of a subsequent meeting of the Committee it was stated that the Directors attended and undertook, if the Corporation refrained from entering on their land, to provide with allotments their employees desirous of cultivating land. It was resolved that, on the express understanding that their undertaking is observed, the Gas Company's land be not entered upon.

Leyton Council and the Lea Bridge Gas Bill.—The following report is made by the Leyton Council regarding the Lea Bridge District Gas Company's Bill: The petition of the Council against this Bill having been lodged, negotiations have followed with the view of withdrawal or modification of the several provisions to which objection was taken, principally the right proposed to be exercised of utilizing the land adjoining the Lea Bridge School in a manner prejudicial to the scholars attending thereat. The Clerk having reported that he anticipated the Company would agree to meet the objection in a manner satisfactory to your Committee, they recommend that authority be given for withdrawal of the petition in the event of the usual undertaking being entered into to delete the objectionable provisions, and the insertion of suitable provisions to be agreed upon for the protection of the Council and consumers.

Public Lighting in Hackney.—The Hackney Borough Council do not recommend the abandoning of public street lighting during the summer. The Works Committee say: The lighting is carried on under a contract which originally was made between the Council and the Gas Light and Coke Company for a period of five years from Nov. 11, 1910, and was continued for a period of five years from Nov. 11, 1915. The contract covers the supply of the necessary gas, the lighting and extinguishing of the lamps, the maintenance and renewal of the inverted incandescent mantles, the cleaning and repair of the glass in the lanterns, and the painting of the columns, lanterns, &c. The terms of the contract have been extremely favourable to the Council during the whole of the period since November, 1910, but more especially so since November, 1915; and we think that, in view of present circumstances, and having regard to the probabilities of the future, it obviously will be undesirable to adopt any course which might have the effect of jeopardizing the continuance of the contract to the date of its termination in November, 1920. Apart from the foregoing consideration, we are not convinced of the wisdom of leaving the bulk of the roads and streets of a borough such as this in entire darkness after nightfall.

Public Lighting of Leicester.—The report of the Deputy Superintendent of the Leicester Street Lighting Department for 1916 shows that the consumption of gas for lighting last year was 3,529,900 c.ft., against a normal use of 85,000,000 c.ft. The cost of gas was £426, against £9100 normal; and the approximate cost per hour was 3s. 1d., against £2 14s. The Gas Department have charged 5s. 3d. per burner per annum for incandescent maintenance (mantles, chimneys, &c.); but this is now insufficient, on account of increased costs. The number of lamps burning was 259, against a normal total of 5927.

Coal Theft at Bury.—At the Bury St. Edmunds Borough Sessions, William Cooper, a stoker, was charged with having stolen coal to the value of 4d., the property of the Bury Gas Company. It was stated that the man had been about 2½ years in the employ of the Company, and during the last twelve weeks his earnings had averaged about £2 os. 5d. per week. He was detected carrying a lump of coal under his coat, and admitted having taken it from the gas-works. Mr. H. R. Wimhurst, the Gas Manager, stated that the accused (who pleaded guilty) had been a steady, good worker, and in every way satisfactory. The Magistrates imposed a fine of £2, to be paid by instalments of 5s. per week.

Auckland (N.Z.) Gas Company.—The annual meeting of the Company was presided over by Mr. J. H. Upton, who said that for the year ended Dec. 31 the total income was £221,279, and the expenditure £164,590, leaving a balance of £56,689 available for dividend, after paying which there would be a surplus of £3643. This was less than the surplus of the previous year by £6738. The reduction was entirely owing to extra costs in manufacture and distribution. The number of consumers was now 28,857, or a gratifying increase of 943 for the year. A portion of the new vertical retort-house would be put into operation during next winter. Of the employees, 81 had given their services to their country. Coal had gone up in price fully 25 p.ct.; and the Company were greatly feeling the effect of war taxes. Thus there was no escape from an increase of 6d. per 1000 c.ft. in the price of gas at Auckland and Devonport.

Employment after the War.—In connection with the question of employment after the war, it is stated that the Birmingham City Council have in mind projects which will involve an expenditure of some 2½ millions. Among these, the Gas Department propose the construction of tanks and holders and railway sidings on the site of the new gas-works at Washwood Heath, at an estimated cost of £250,000. The land has been purchased by authority; but no sanction has yet been obtained for the capital expenditure. The scheme will find employment for from 300 to 400 men for two years. The reconstruction of gas-works at Windsor Street (which may be necessary during the current year) will cost £160,000, and miscellaneous repairs, renewals, and alterations on gas-works £56,000; and these sums will be paid out of revenue. There are also extensions, renewals, and alterations of mains in the area of supply, provision of governor-houses, &c., which will involve a total expenditure of £150,000; and this money, too, will be paid chiefly out of revenue.

Hot Water for Factory Use.

95% of the Factories in any district require hot water for various purposes.

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is being extensively adopted in Factories, Workshops, etc. Can be connected up in batteries to supply any number of taps. Constructed throughout of Iron, there is practically no maintenance required.

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WARRINGTON AND LONDON.

Price Increased at Walton-on-Thames.—The Directors of the Walton-on-Thames and Weybridge Gas Company regret that, owing to the shortage of shipping and the consequent great increase in freights, and the higher cost of raw material used in manufacture, they are compelled to raise the price of gas 4d. per 1000 c.ft. from March 25. The ordinary charge before this addition was 4s. 3d. per 1000 c.ft.

Keighley War Bonus.—The Keighley Town Council have approved a decision by the War Bonus Committee for the payment of a war bonus of 5s. per week, and 6d. per week for each dependant child under 13, to all employees of the Council over 21 years of age, irrespective of marital condition, commencing April 1, and continuing to three months after the declaration of peace, provided that the bonus shall include, and be in substitution for, any bonus already granted by the Council, and with the exception that the bonus is not to be paid to any official in receipt of a salary exceeding £200 per year, any clerk, official or female employee who has been appointed since April 1, 1916, and any clerk or official or workman who has received an advance of salary or wages in lieu of war bonus, except to the extent by which the bonus now granted exceeds the amount of such advance. In answer to questions by councillors, Alderman Midgley said the Council had been paying, roughly, just over £2000 a year in bonus and allowances; and the new scale would practically double this amount.

Gas Manager's Experiences in War Time.—Presiding at the annual meeting of the Seaton Gas Company last week, Mr. C. F. Gosney eulogized the services of the officials, and said the Manager had had a very trying experience, and, owing to the depletion of the staff, had had to act at times as stoker and fitter and in other capacities. The Manager remarked that the hardest part of his work had been the maintenance of diplomatic relations with the customers. The Directors reported diminished consumption owing to the lighting restrictions. A dividend of 5 p.ct. was declared.

Gas-Works Deficit at Leeds.—In the course of a debate on the estimates in the Leeds City Council, Alderman Ford said he regretted that Alderman Wilson had not seen his way to deal at all with the large outstanding balance on the gas account. It was something like £30,000; and while Alderman Wilson was making his reserves elsewhere, it was a pity that he did not try to deal with the gas deficiency. In reply, Alderman Wilson said it was his aim to get the four trading concerns to have reserves of £25,000 each, or £100,000, so that one could come to the help of another—if necessary. A portion of reserve money was to be appropriated for reducing the deficit on the gas undertaking; but it would be far better for the Gas Committee to put up their price to the consumer, and so get straight. Alderman Ratcliffe said the deficit on the gas-works was caused by the strike.

STOCK MARKET REPORT.

The Stock Exchange had a rather disappointing time last week, and once again realized that nothing but the unexpected can safely be counted on to happen. The great opening day of dealings in the new War Loan, which was to cast its beneficent influence around on markets in general—inaugurating a bright and buoyant career to which they had long been strangers—had arrived. Synchronous with this was the receipt of war news telling of continuous and repeated successes on many fronts, and culminating in the Gaza victory. Everything was roseate; and yet, somehow or other, things did not go quite right, and markets were dull.

There were considerable dealings in War Loan issues, the 5 p.ct. opening at 95¼. But before the close of the day it had touched 94⅞ more than once. Similarly the "B" was done at 100¾ early in the day, but saw 99½ later. The next three days were not strong; but on Friday and Saturday there was an agreeable rally. Home Rails were pretty firm, and the prior charges were in request. Americans moved uncertainly, reflecting political shapelessness; and Canadians were flat on high working costs. Argentines were quite out of favour. The Foreign Market maintained its strong points of the previous week; French, Chinese, Japanese, and Brazilian being well supported. South Africans were variable, but fair on the whole. Among the rest, Rubber underwent a reaction, Banks were easy, Oil was firmer.

Business in the Gas Market was on an extremely reduced scale—neglected perhaps while all eyes for fixed for awhile on the career of the War Loan issues. Prices, however, did not appear to suffer any change for the worse, except in the case of one or two foreign undertakings specially exposed to depreciation; while, on the other hand, the Metropolitan companies showed, if anything, a tendency to harden. In the Money Market rates for short loans were very easy. Discount was almost suspended while awaiting results of Treasury Bill tenders; and when they were known, they were not liked. The high Bank rate was continued; but some relief is looked forward to on Thursday.

Bargains done for cash during the week were as follows: On Monday, Bombay 4⅜, Bournemouth B 10¾, ditto preference 9⅛, Commercial debenture 54, Gas Light ordinary 65⅜, ditto preference 70, 70⅛, Tottenham "B" 70, 70⅜. On Tuesday, Commercial 4 p.ct. 72, ditto debenture 53⅜, Gas Light maximum 56, 56⅛, Oriental 107, Primitiva preference 60s., River Plate debenture 64½, 65, South Metropolitan 75¼, 76. On Wednesday, Continental Union 37, 37⅛, Gas Light ordinary 65⅜, 66, 66⅛, 66⅛, ditto maximum 55⅛, 55⅜, ditto preference 70⅛, Imperial Continental debenture 59⅛, Primitiva 40s., South Metropolitan 75⅛, 76. On Thursday, Gas Light ordinary 66⅛, Imperial Continental debenture 59⅜, South Metropolitan 75⅛, 76. On Friday, Gas Light ordinary 65⅝, 66, 66⅛, 66⅛, ditto maximum 55⅛, Imperial Continental 65, 65⅛, Primitiva 40s., 40s. 4½d., ditto preference 62s. 6d., South Metropolitan 75⅛, 76, Tottenham "B" 70, 70⅛. On Saturday, Gas Light ordinary 56⅛, ditto preference 70⅛, 70⅜, Imperial Continental 64½, 65, ditto debenture 60, South Metropolitan 75, ditto debenture 55¾.

The Bank rate is 5½ p.ct., as fixed on the 18th of January.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue.	Share.	When ex-Dividend.	Previous Div. on Dividend and Bonus.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
£			p.c.					
175,472	Stk.	Mar. 10	4	4%	Aldershot 4 p.c. Pref.	..	58–63*	..
1,551,868	,,	April 8	2½	5⅛%	Alliance & Dublin Ord.	59–64	62–64	..
874,000	,,	July 10	4	4%	Do. 4 p.c. Deb.	76–79	58–63	..
280,000	5	April 29	7½	4/6	Bombay, Ltd.	5⅞–6⅛	4⅜–5⅛	4⅜
50,000	10	Feb. 26	16	15/-		29–30	24–26*	..
883,110	10	,,	7	7/-	Bournemouth Gas and Water: 10 p.c.	15–15¼	10⅜–11⅛*	10⅜
115,000	10	,,	6	6/-	B 7 p.c.	13½–14	9⅛–9⅜*	9⅛
159,740	—	—	—	4%	Pref. 6 p.c.	..	71–73	..
992,045	Stk.	Feb. 26	14	56/-	4 p.c. Deb.	..	83–85	..
734,920	,,	,,	11	53/9	Brentford A Consolid.	261–266	80–83	..
55,000	,,	,,	5	5%	Do. B New	204–209	83–88	..
221,400	,,	June 11	4	4%	Do. 5 p.c. Pref.	109–111	67–69	..
217,380	,,	Feb. 26	11	10%	Do. 4 p.c. Deb.	91–93	152–162*	..
344,300	,,	,,	8	7%	Brighton & Hove Orig.	208–213	112–117*	..
530,000	20	Mar. 26	12½	22/6	Do. A Ord. Stk.	154–159	32½–33½*	..
120,000	Stk.	June 26	4	4%	British	44–45	66–68	..
245,771	,,	,,	4	4%	Do. 4 p.c. Deb. Stk.	88–90	57–60	..
100,000	10	—	—	—	Buenos Ayres 4 p.c. Deb.	85–87	1½–2½	..
100,000	10	—	—	4½%	Cape Town & Dis., Ltd.	1½–2½	4½–5	..
100,000	Stk.	June 26	4½	4½%	Do. 4½ p.c. Pref.	4–6	58–63	..
157,150	,,	Feb. 26	5	5%	Do. 4½ p.c. Deb. Stk.	70–75	79½–80½	..
1,513,280	,,	Feb. 12	5/9/4	49/4	Chester 5 p.c. Ord.	108–110	71–73	72
560 000	,,	,,	5½	46/8	Commercial 4 p.c. Stk.	105–108	63–68	..
475,000	,,	June 11	3	3%	Do. 3½ p.c. do.	103–105	52–54	53⅜–54
800,000	,,	,,	4	—	Do. 3 p.c. Deb. Stk.	69½–71½	37–39	37–37½
200,000	,,	,,	7	—	Continental Union Ltd.	76–79	58–60	..
278,400	—	—	—	11½%	Do. 7 p.c. Pref.	115–118	170–180*	..
—	—	—	—	10%	Croydon B and C 7 p.c..	..	..	..
492,270	Stk.	—	6	5½%	Do. E	..	95–100*	..
55,000	,,	—	4	4%	Derby Con. Stk.	123–125	80–83	..
1,002,180	10	July 29	10	7/6	Do. Deb. Stk.	102–104	10–11	..
16,313,430	Stk.	Feb. 10	4/17/4	42/-	European, Ltd.	17½–18	65–67	65⅜–66½
2,600,000	,,	,,	3½	3½%	Gas Light and Coke: 4 p.c. Ord.	98–102	54–57	55¼–56½
4,062,235	,,	,,	4	4%	3½ p.c. max.	76–79	69–71	70–70½
4,674 850	,,	June 11	3	3%	4 p.c. Con. Pref.	96–99	..	..
130,000	,,	,,	10	10%	3 p.c. Con. Deb.	72½–74½	54–56	..
258,740	,,	Mar. 12	5	4½%	10 p.c. Bonds	..	..	..
70,000	10	April 29	11	6%	Hastings & St. L. 3½ p.c.	87–89	76–81*	..
86,600	—	—	—	9½%	Hongkong & China, Ltd.	16½–16⅝	8–9	..
131,000	Stk.	Mar. 12	7⅞	7⅞%	Hornsey 7 p.c..	..	129–130*	..
65,780	,,	,,	6⅜	5⅞%	Ilford A and C.	151–154	102–107*	..
65,500	,,	June 26	4	4%	Do. B	115–118	80–85*	..
4,910,000	,,	May 14	9	4½%	Do. 4 p.c. Deb	92–94	71–74	..
1,235,000	,,	Feb. 12	3½	3½%	Imperial Continental	150–160	65–68	64½–65
235,242	,,	Mar. 12	6½	6½%	Do. 3½ p.c. Deb. Red.	84–86	58–61	59½–60
2,498,905	,,	Feb. 26	10	5%	Lea Bridge Ord. 5 p.c.	119–121	85–90*	..
306,083	,,	June 26	4	4%	Liverpool 5 p.c. Ord. A	211–213	81–83	..
75,000	5	June 11	6	2/-	B	146–148	..	..
250,000	100	April 1	4½	4½%	Do. 4 p.c. Pr. Deb. Stk.	..	72–74	..
541,920	20	May 28	4	6/-	Malta & Mediterranean	4¼–4⅝	3¼–4⅜	..
1,875,892	Stk.	July 29	4½	4½%	Met. of Melbourne 4½ p.c. Deb.	99–101	90–100	..
529,705	,,	June 26	3½	3½%	Monte Video, Ltd.	11½–12	8–8¼	..
55,940	10	Feb. 26	7/14/0	7/-	Newcastle&Gatsh'dCon.	98½–99½	73½–74½	..
300,000	Stk.	May 14	8	8%	Do. 3½ p.c. Deb.	82–83	73–75	..
60,000	5	Mar. 26	10	1/-	North Middlesex 7 p.c..	14–15	10–11*	..
60,000	50	Feb. 26	13	12½	Oriental, Ltd.	117–122	105–107	107
100,000	50	,,	12	11½	Ottoman, Ltd.	7¼–7⅜	2–3	..
52,000	50	,,	10	9%	Portsea, Island B	128–131	92–97	..
249,980	5	April 29	8	—	Do. C	118–121	85–90	..
499,960	5	June 26	5	2/6	Do. D	..	..	..
521,600	100	June 2	4	4%	Primitiva Ord.	5⅛–6	1⅞–2⅛	40/–40/4½
—	—	—	—	4%	Do. 5 p.c. Pref.	4⅝–5	55/–65/-	60/–62/6
346,198	Stk.	June 26	4	4%	Do. 4 p.c. Deb.	91–93	78–80	..
150,000	10	May 14	6	6/-	Do. ,, ,, 1911	..	..	..
125,000	50	July 1	5	5%	River Plate 4 p.c. Deb..	85–87	61–67	61⅝–65
135,000	Stk.	Mar. 12	10	10%	San Paulo 6 p.c. Pref..	10½–11	7⅞–8¾*	..
125,000	10	May 14	6	6/-	5 p.c. Deb..	47–49	42–44	..
135,000	Stk.	Mar. 12	10	10%	Sheffield A	223–224	180–190*	..
209,984	,,	,,	10	10%	Do. B	222–224	180–190*	..
523,500	,,	,,	10	10%	Do. C	220–222	170–180*	..
90,000	10	May 28	9	6/-	South African.	10½–11½	..	..
6,609,895	Stk.	Feb. 10	5/4/0	46/8	South Met. 4 p.c. Ord.	111–113	74–76	75½–76
1,895,445	,,	July 10	3	3%	Do. 3 p.c. Deb.	72¾–74½	54–56	55¾
224,820	,,	Feb. 26	8½	8%	South Shields Con. Stk.	157–159	144–146	..
952,795	,,	,,	6	48/4	S'th Suburb'n Ord. 5 p.c.	114–116	7⅜–78*	..
60,000	,,	,,	5	5%	Do. 5 p.c. Pref.	110–112	77–79*	..
135,000	,,	—	—	48/4	Do. West Kent	..	..	..
187,558	Stk.	June 26	5	5%	Do. 5 p.c. Deb. Stk.	116–118	88–90	..
647,740	,,	May 14	5	5%	Southampton Ord.	99–102	77–79	..
120,000	,,	Feb. 12	7½	7⅛%	Tottenham A 5 p.c.	185–188	95–100	..
782,275	,,	,,	6	5⅝%	District B 3½ p.c.	115–117	68–73	70–70½
181,255	,,	June 26	4	4%	4 p.c. Deb.	87–89	65–67	..
182,380	10	Dec. 30	5	—	Tuscan, Ltd.	5–6	1–2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93–95	60–65	..
236,476	Stk.	Mar. 12	5	5%	Tynemouth 5 p.c. max..	103½–109½	91–92	..
30,000	,,	Feb. 26	8⅜	0/-	Wandsworth, Wimbledon, and Epsom—			
255,636	,,	,,	6⅞	5/-	Wandsworth A 5 p.c..	151–156	114–1'9*	..
108,075	,,	,,	5/17/8	56/-	Do. B 3½ p.c.	129–134	99–101*	..
352,000	,,	,,	6½	58/9	Do. C 3½ p.c.	110–115	86–91*	..
98,000	,,	,,	6⅜	65/-	Wimbledon 5 p.c.	117–122	88–93*	..
88,416	,,	June 26	3	3%	Epsom 5 p.c.	121–126	96–101*	..
					3 p.c. Deb. Stk.	66–69	51–54	..

* Ex. div.

The annual report of the Chief Constable of York mentions that of 192 gas-meters tested, seven were rejected. Three were fast, two low, and two passed gas without registering.

The business of J. Blakeborough and Sons, of Brighouse, has been converted into a limited liability company, with a capital of £275,000 in £1 shares, of which 125,000 are preference shares.

The Newcastle Corporation are communicating with local authorities asking them to support the Corporation in urging the Board of Trade to take steps to introduce legislation to amend the Sale of Gas Act, 1859.

An application by the general labourers and fitters at the Middlesbrough Gas-Works for an increase in wages from 5¾d. to 7d. and 8¼d. to 10¼d. respectively, has been deferred by the Gas Committee until their next meeting. Meantime, a report is to be prepared.

A fault in a trunk feeder supplying a sub-station at Dundee, which resulted in a portion of the tramway current and that of some works being stopped for awhile, was found to be due to the fact that the ground, chiefly composed of gas-works refuse, was on fire under the cables. This resulted in the cables giving way.

Colonel Brotherton, of Leeds, the Chairman of Messrs. Brotherton and Co., Ltd., ammonia and tar distillers, has bought by auction the Mersey Chemical Works at Bromborough Port, New Ferry, Birkenhead, for £135,000. The works (which have an area of 36½ acres) were German-owned at the outbreak of the war, and were sold under an order from the Board of Trade, with the stipulation that they must be continued as a dye-producing concern. The sale aroused considerable interest. The opening offer of £60,000 was rapidly advanced, until Colonel Brotherton finally became the purchaser at the figure named. Colonel Brotherton informed a "Leeds Mercury" representative that the works were erected by the German Badische Anilin and Soda Fabrik and their associated companies, after the passing of the Act of Parliament which provides that British patents must be worked in this country. The works, he said, comprise the very finest and most modern dye-making plant; and it is his intention to develop the concern to the fullest extent, in order to help in firmly establishing the dye-making industry in Britain.

The report for the past year of Stewarts and Lloyds, Ltd., states that the net profit, after setting aside £100,000 for depreciation and making provision for estimated general liability, amounts to £259,398; and £102,849 was brought in, making £362,247. There is appropriated to reserve fund £60,000, and to employees' benefit fund £20,000 (making it £70,000); and, after paying the preference dividend of 6 p.ct., less tax, the Directors recommend a further dividend at the rate of 10 p.ct. per annum on the preferred ordinary shares (making 10 p.ct. for the year, less tax), a dividend for the year of 2s. per share, and a bonus of 6d. on each deferred share, free of tax, carrying forward £111,122.

It was reported to the Brighouse Town Council last week that at their last recent meeting the Gas Committee had received notices from nine gas stokers, in consequence of their original application for payment at the rate of 6s. 4d. per shift not having been granted. The Committee had decided to grant this rate, inclusive of the present war bonus, for the period of the war, after which the rate is to be reconsidered. The Keighley Town Council last week decided to advance the wages of the workmen at the gas-works on shift by 4d. per shift, and of other workmen under the Gas Committee by ½d. per hour—war bonus to be paid in addition. It was explained that this increase of wages brought the rate to about the same as those of neighbouring authorities.

The following report has been made by the Acting Borough Surveyor to the Eastbourne Town Council: "Several weeks ago, Mr. Goulbern Lovell interviewed me regarding the possibility of manufacturing cheap fuel locally from coke breeze, as is now proposed at Birmingham. I suggested that if a satisfactory fuel could be manufactured from waste products such as refuse ashes or destructor clinker, it would probably meet with more acceptance by the Corporation. The inventor has therefore made several experiments with local material; and I submit sample of the manufactured product. It is estimated that the cost of producing this locally would be about £1 per ton. The matter is submitted to the Committee as being of national importance, capable of far-reaching results, and worthy of further consideration." It was resolved that the matter be referred to a Sub-Committee to consider and report their recommendations.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

MANAGER AND SECRETARY. Littleborough Gas Company. Applications by April 13.

CHIEF LABORATORY ASSISTANT. Coventry Gas Department.

WORKS CHEMISTS. Nechells Gas-Works, Birmingham.

FOREMAN. Spalding Gas-Works.

GAS-FITTERS. Hereford Gas-Works.

Appointments, &c., Wanted.

GAS FITTER. No. 6293.

Plant, &c. (Second Hand) Wanted.

BRUSH SCRUBBERS. No. 6292.

Plant, &c. (Second Hand), for Sale.

EXHAUSTERS. Bridlington Gas-Works.

RETORT IRON WORK. Barnoldswick Urban District Council.

TENDERS FOR

Coal.

RHYL GAS DEPARTMENT. Tenders by April 17.

Fire Clay Goods and Retort Setting.

SCUNTHORPE GAS DEPARTMENT. Tenders by April 28

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer—not necessarily for publication, but as a proof of good faith.

EASTER HOLIDAYS.

It is proposed to issue the "JOURNAL" a day later next week—on Wednesday rather than Tuesday.

Orders to Alter or stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Saturday.

Wanted, For Sale, and Tender Advertisements, Six Lines and under 3s.; each additional Line, 6d.

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All Communications, Remittances, &c., to be addressed to WALTER KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4:

Telegrams: "GASKING, FLEET LONDON." Telephone: Holborn 6857.

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SPENCER'S Patent Inclined HURDLE GRIDS.

THE very best Patent Grids for Holding Oxide Lightly.
See Illustrated Advertisement, Feb. 13, p. 278.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, London, S.E.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.
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Telephones: 815 Oldham, and 2412 Hop., London.
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BENZOL PLANTS FOR GAS-WORKS.

BAGLEY, MILLS, & Co., Ltd., 92, Victoria Street, Westminster, S.W., invite enquiries from all gas-works making 75 million cubic feet and upwards per annum.
See illustrated Advertisement Feb. 20, p. III. of Centre.

JOHN RILEY & SONS, Limited, Chemical Manufacturers, Hapton, near Accrington, are MAKERS of Special SULPHURIC ACID, for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol, which has now been used for upwards of 60 years. Reference given to Gas Companies.

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Telegrams: "Patent London." 'Phone: 243 Holborn, And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

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Address, stating Wages, to No. 6293, care of Mr. King, 11, Bolt Court, Fleet Street, E.C. 4.

TWO Works Chemists Wanted. Duties to consist of General Gas-Works Routine. Previous Experience on Gas-Works essential.

Apply, by letter, stating Age, Experience, Qualifications, and Salary required, to E. W. Smith, Chief Chemist, Central Laboratory, Nechells Gas-Works, Birmingham.

WANTED—Several Gas-Fitters (ineligible for Military Service). Wages, 9d. per hour to suitable men.

Apply to Arthur Roberts, Manager, Hereford Gas-Works.

WANTED. — Gas-Works Foreman for 60-Million Works. Vertical and Horizontal Retorts, Tar Dehydrating and Sulphate Plants. Must be good Mechanic, thoroughly qualified to Repair, and Keep in Working Order, Engines and Machinery.

Applications, with Testimonials, stating Age and Wages required, to the Manager, Gas-Works, Spalding.

LITTLEBOROUGH GAS COMPANY.

THE Directors of the above Company invite Applications for the Position of MANAGER and SECRETARY for their Undertaking.

Applications, stating Age, Qualifications, and Salary required, with *copies* of not more than Three recent Testimonials, must be addressed to the Chairman, Littleborough Gas Company, Hare Hill, Littleborough, endorsed "Manager," not later than the 13th day of April, 1917.

By order,
S. E. Halliwell,
Manager and Secretary.

COVENTRY CORPORATION.
(Gas Department.)

CHIEF Laboratory Assistant wanted. Salary to commence, £160 per Annum. Duties consist of General Gas-Works and Carburetted Water-Gas Plant Routine, and opportunities of obtaining Experience in the Control of Benzol, Sulphuric Acid, and other Bye-Product Plants.

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Gas-Works,
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March 15, 1917.

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Offers to No. 6292, care of Mr. King, 11, Bolt Court, Fleet Street, E.C. 4.

THE Barnoldswick Urban District Council Gas and Water Department have FOR SALE Complete RETORT IRON WORK for Three Beds of Sixes and one of Sevens.

Particulars and Form of Tender can be obtained from the undersigned.

J. W. Thompson,
Engineer and Manager.

Gas-Works, Barnoldswick.

GAS-WORKS requiring Extensions should Communicate with FIRTH BLAKELEY, SONS, AND CO., LIMITED, Dewsbury, who make a Speciality of Catering for the Smaller Gas Concerns. Prices Reasonable; quality and results, the best. Satisfaction Guaranteed.

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SCUNTHORPE URBAN DISTRICT COUNCIL.
(Gas Department.)

TENDERS are invited for the Supply of MATERIAL and RESETTING of Two Beds of RETORTS, REGENERATORS, FLUES, &c.

Copies of Specifications may be obtained from the undersigned, at the Gas-Works, Scunthorpe, Lincs.

Sealed Tenders, endorsed "Retorts," to be addressed to G. E. Davy, Esq., Clerk to the Council, 108, High Street, Scunthorpe, Lincs., not later than April 28, 1917.

The Council do not bind themselves to accept the lowest or any Tenders.

J. W. Turner,
Manager.

Gas-Works,
Scunthorpe, Lincs.
March 29, 1917.

RHYL URBAN DISTRICT COUNCIL.
(Gas Department.)

TENDERS FOR COAL.

THE Rhyl Urban District Council are prepared to receive TENDERS for the Supply of 5500 Tons of Screened GAS COAL, and 100 Tons of Best HOUSE COAL, to be Delivered f.o.r. Rhyl, during the Twelve Months ending May 30, 1918, in such quantities and at such times as may be required.

Form of Tender and Particulars of Conditions may be obtained on Application to Mr. Leonard G. Hall, Assoc.M.Inst.C.E., Gas Engineer's Office, Paradise Street, Rhyl.

Sealed Tenders, endorsed "Tenders for Coal," to be Delivered to me, the undersigned, not later than April 17, 1917.

Approved security will be required.

The Council do not bind themselves to accept the lowest or any Tender.

(Signed) Arthur Rowlands,
Clerk to the Council.

Council Offices, Clwyd Street,
Rhyl, March 30, 1917.

SALES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MESSRS. A. & W. RICHARDS beg to notify that their SALES BY AUCTION of NEW CAPITAL ISSUED UNDER PARLIAMENTARY POWERS, and of STOCKS and SHARES belonging to EXECUTORS and other PRIVATE OWNERS in LONDON, SUBURBAN, and PROVINCIAL GAS and WATER COMPANIES, take place PERIODICALLY at THE MART, TOKENHOUSE YARD, E.C.

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